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SIGNIFICANCE OF VISUAL DEFECTS IN WAR PRODUCTION EFFORT

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Visual defects as they concerned the war production effort prior to 1943 were mainly those within industry. As the demand for guns, tanks, planes, ammunition and ships grew, it was reflected in an increasing demand for special tempered steel, chemicals, precision parts, armor plate and alloys. More had to be produced by each machine unit; fewer mistakes were allowable; less waste of material was permitted; more sensitive inspecting was called for. A direct correlation was found in graphs showing the relationship between accuracy and visual perfection and between lost time accidents and defects in visual performance. Here and there over the country it became imperative to conduct a visual survey of whole industries in which vision played an important part in all units of production. In other industries it became imperative to conduct sectional visual studies of special key employees—such as assorters, inspectors, crane operators and fine-part assemblers. This quickened effort to evaluate the part played by eyes in war production brought realization that visual skills are of utmost importance not only in selection of men for the armed forces but in placement and selection of men and women in the war industries.

The detailed data previously discovered necessary in evaluation of an employee's visual ability was built into the preemployment and preplacement pattern; namely, determination of the minimum visual standards for the job and adherence to them. These standards were simple groupings of the basic visual findings according to the visual demands of job groups and included (1) uncorrected acuity for distant and for near vision, (2) acuity with the glasses habitually worn, i. e. work acuity, (3) muscle balance for distant and for near vision, (4) stereopsis and (5) color appreciation. To these basic findings, which designated a minimum amount of information, were added such special tests of near vision (e. g., determination of the near point of accommodation and of convergence), as might be needed in selecting eyes for exceedingly intricate work done within 12 inches from the eye.

These visual tests, which are simple and yet so much more complete and more accurate than had previously been considered needful, had been studied statistically in 1940. They were reflected in certain percentages and graphs worked out both for men already on the pay rolls of industry and for applicants seeking jobs in industry. As is shown in the accompanying graph, the percentage of defects of acuity, muscle balance, stereopsis and color vision were almost the same within industry as they were outside of industry, i. e., in the labor market of that day. This labor market of course reflected the type of civilian reserve from which industry had to draw to increase its pay rolls. In a recently completed study of a war industry the same labor pool, or civilian reserve, was analyzed as of 1943, as well as the level of defects within industry as of 1943, and the results were compared with those of 1940.

The picture revealed as of today is indeed a startling one. Its significance in terms of the war production effort is of immediate concern. First, what every one has sensed and what has often been stated as true without factual data to substantiate it has now been proved. Industry is indeed scraping the bottom of the barrel! In further analyzing the graph one finds that the percentages of visual defects given in table 1 were found in the civilian labor pool, or among the applicants, in 1940 and in 1943:

In 1940 and in 1943 the employees already on the pay roll showed the percentages given in table 2.

The percentage of defects among those who had already slipped by the admission tests and were at work early in 1943 has risen slightly, but, most serious of all, the percentages of defects in the unaided eyes of the slowly dwindling stream of civilian applicants has doubled. This per se would not be so ominous if the percentage of defects among persons wearing their work correction was not also up, and almost to an equal degree. This means that not only has the task of further improving visual efficiency within industry become greater but the need of visual rehabilitation among the civilians of 1943 is very great. Salvaging of human eyes will become an even greater task in 1944 and 1945.

This problem immediately presents itself to the three groups that are most directly concerned. First, management, needing greater visual perfection in its increasingly complicated production skills, must be more vigilant than ever in the use of screening tests for its applicants. There are now many jobs where a person with a wooden leg or one arm can turn out top work. But the jobs where he does not need to see well are indeed becoming rare. In some industries management is searching the highways and the byways for persons to take over its new and idle machines. In other industries it is searching for labor to staff its gigantic new production lines. It is at this point that war production turns to the second group directly concerned, the highly trained experts who can help to salvage the eyes of those men and women, the third group, who are waiting at the gates and otherwise will be rejected.

In order to appreciate fully this gigantic problem one must recognize many new factors, but one especially,

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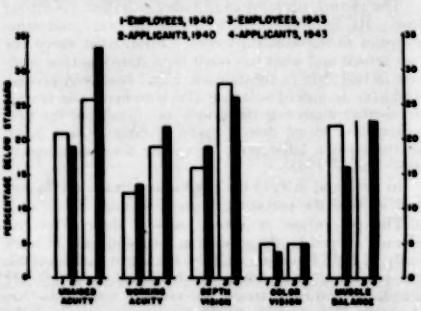
that in order really to salvage this most precious human commodity—vision for today's urgent need—it is necessary to find new, speedy and directly controllable methods of conservation. Formerly an indifferent "Go see some one about your eyes and come back—if you can pass the vision test, maybe we'll have a job for you" was the statement of the employment office. Now in many vital industries it is essential to find out immediately, often actually inside the plant, whether the man with 20/100 vision in each eye can have his vision brought to normal with glasses or the woman with 20/200 vision in the right eye and 20/20 in the left has an amblyopic right eye, optic nerve atrophy or macular retinitis. The latter can do her type of work with one eye, but has she a progressively ocular disease that will in due time affect her other eye? As the age level of applicants rises except for women and minority groups, the vigilance of the refractionist and the responsibilities of both the management and the ophthalmologist increase.

Men and women applying for war work form the group directly concerned. They come from among the ordinary civilians, the citizens of the home communi-



Visual defects of employees and applicants in 1940 and 1943. The percentage of each defect was found to be higher among persons over 40 than among those under 40.

ties, many of whom have never worked in industry. They have worked in stores and homes and supplied the many services of modern existence, or they have not worked at all. In fact, they can truly be said to constitute the rank and file of the practice of any ophthalmologist in city or village. They therefore reflect the whole range of ophthalmic diseases and troubles encountered in office practice.

The consulting ophthalmologist working with the industries he is responsible for has now to supervise with extreme vigilance the entire industrial eye program: treatment of eye injuries, eye protection plans, job standard evaluations and rehabilitation procedures. He must study the applicants turned over to a refractionist for routine correction through failure in the screening tests. As the age level rises and the Manning tables become operative he has also to search for glaucoma, for early degenerative retinal diseases, for early lenticular changes and for early hypertensive signs in the fundi. Many of the applicants are totally unaware that anything is wrong; many have never had any sort of ocular examination; the vision of many can be saved. However, all this is only a small part of the problem which has been laid so suddenly at the ophthalmologist's door. His vigilance must further extend itself. It must be carried into his private practice; he must assist local medical societies in setting up proper educational programs on the radio and in the newspapers, wherein people are urged to make sure that all is well with their eyes for their country's sake as well as for their own.

These facts lead to but one conclusion, namely that physicians in general have an exceedingly important

Table 1.—*Visual Defects in Civilian Labor Pool or Among Applicants*

	1940	1943
Acuity unaided (naked eye)	18	34 (almost double!)
Working acuity (with whatever correction was worn)	14	23
Depth perception	18	26
Color appreciation	4	5
Muscle balance	16	23

and a direct responsibility in the war production effort. This responsibility is twofold. First, they must walk boldly out of their "ivory towers" and go directly to industry and offer their services. They must do this with an honest determination to be open minded and realistic. They must try not to let old stereotyped ways of doing things (even if these ways are good) interfere with their willingness to learn new ways, and quickly, if the occasion calls for them. This is a war, and it is their war. Management, labor, the farmer, the housewife and the 18 year old have learned new ways of doing things, and they have not always been pleasant ways. So too physicians need badly to loosen up their tight collar of hesitancies and worrisome fears and get to work on the problems that only they are trained to solve, even if the new but necessary ways are unpleasant. To illustrate, I shall take an actual example—one industry and one day's group of 35 applicants who had been found to have substandard visual acuity in their original screening tests. These 35 represent according to statistics the average number of defects in acuity found for about every hundred persons "screened," namely about 35 per cent. The results of refraction were as follows: Of the 35, 18 who would otherwise have been left in class B were brought to normal with proper glasses and put into class A; 10 who would otherwise have been rejected conclusively were brought to normal with glasses and put into class A, and, 7

Table 2.—*Visual Defects Among Employees*

	1940	1943
Acuity unaided	21	26
Working acuity	12	18
Depth perception	16	28
Color vision	5	5
Muscle imbalance	22	24

were rejected because of disease (for example, optic nerve atrophy, cataract, macular hemorrhage and old perforating injury of the eye).

In this particular war plant the visual standards had to be high because of the nature of the work—class A having 20/30 vision or better in both eyes. In terms of the war need, 28 of 35 applicants were salvaged immediately and put to work at class A jobs. Ten of these would undoubtedly have been lost entirely to this particular plant, at which they were applying, if they had simply been told to go get their eyes fixed. There

are still too many jobs open where nobody bothers about whether or not the applicant sees well. Eighteen of these applicants would have been denied class A jobs, and management in this plant, needing top visually qualified workers most urgently, would not have been able to use these 18 men except as sweepers and janitors and in similar capacities. In this instance, of course, the ophthalmologist was working close to the day by day problems of the industry and was therefore actually responsible for equipping 28 of 35 men. This is the salvage figure for one day for one industry. Figured by the month, it means an average of 800 to 850 men and women given a chance to work by being equipped to meet the requirements. Such salvaging should occur day after day, month after month, in industry after industry, and it demonstrates how ophthalmologists can face their first responsibility by going forth to meet the needs of industry inside its gates.

The second great responsibility of the ophthalmologist is to make effective a newly conceived approach to the daily office routine and private practice. This is reflected by exercise of the utmost vigilance in:

1. Correcting refractive errors for the job, asking wives and 17 year olds who are now working exactly what they are doing and prescribing accordingly.

2. Using his previous knowledge, or acquiring what more he may need, so as to give orthoptic training for occupational objectives. For instance, the small-parts assembly girl whose previous close work consisted in reading the latest best seller or sewing on buttons now does close work for eight to ten consecutive hours six days a week. She has an exophoria that gives her great discomfort and makes for many mistakes because of the blur produced. She can probably be fully rehabilitated by orthoptic exercises and good general medical treatment. A low hemoglobin content, a low basal metabolic rate, infected tonsils and abscessed teeth are luxuries in wartime.

3. Searching for incipient glaucoma; removing cataracts; discovering the real causative factor in a contact dermatitis of the lids (bran, oil, paint, chemicals); curing a stubborn chronic staphylococcic conjunctivitis which causes extreme annoyance in the glare of an inspector's spotlight; taking care of patients with foreign bodies, flash burns and other injuries quickly (ahead of private patients); sending workers with minor injuries back to work as soon as possible; keeping a sharp lookout for scattered cases of epidemic keratoconjunctivitis, and protecting the industrial worker by isolating the occasional infected school child or housewife, who might otherwise be the source of trouble for an entire plant.

4. Teaching parents how a neglected squint can keep Willie from flying a plane or perhaps being able to choose freely later in life a technical occupation in which binocular vision is essential. The ophthalmologist should take time and use pressure in "selling" what is in his honest opinion the right thing to be done.

These itemized particulars of course form only a part of the full picture with which every busy ophthalmologist is daily occupied. The objectives have had to become streamlined in order to meet the challenge of a nation of workers. There are few if any "drones" left in the hive, and their human counterparts had perhaps best be left sitting in reception rooms until the last.

Ophthalmologists do not need much more than an honest desire to learn something of industry's needs in the sphere of visual problems and a willingness to try to do things in new ways, new places and under new circumstances in order to take their proper and most important place on the home front. Visual defects are of real significance in the war production effort.

112 Rimbach Street.

ABSTRACT OF DISCUSSION

DR. H. GLENN GARDINER, Chicago: This is a graphic representation of what spells the success or failure of many such programs. There can be found here probably one of the greatest rehabilitation programs that has been brought forth during the war.

DR. T. L. TERRY, Boston: Dr. Kuhn mentioned "determination of minimal visual standards for a given occupation." That is not easily obtained nor is it an exact determination, as the individual with superior mental ability could undoubtedly perform the required work with a lower visual standard than one with a less agile mind, provided, of course, asthenopia did not arise. It would serve a useful purpose if with every type of work a really scientific minimal visual standard should be established on a scientific basis. It is satisfying to note that this is being done. These tests of the individual workers do need to be as simple as possible so that they can be done accurately and rapidly without assuming that the applicant who is being tested is above average mentality. Dr. Kuhn's reference to color appreciation rather than tests for color blindness is well worded. Some who are not color blind still have faulty color appreciation, as evidenced by those who at first show evidence of color blindness in their test for military service and who, with some study of color appreciation, in turn appear to prove that they have attained adequate color vision for even the highly specialized branches of the armed forces. The optimistic point of view of Dr. Kuhn is noteworthy. Her reference to the important need of visual rehabilitation shows that many visual disturbances she has noted are to a certain extent, at least, not hopeless. To stress prevention of eye injury is a matter of great importance in this consideration as well. One type of condition that has come to my attention forcefully has been injury to the eye from spun glass. This patient has a small spill of spun glass $\frac{5}{1,000}$ of an inch in diameter and $\frac{1}{6}$ of an inch long projecting through the cornea into the anterior chamber within the pupillary area. Although it is flexible, experiments show that such a glass spill will puncture the lens capsule before it bends. The information from the industrial manager is that this accident was due to the fact that the young employee did not follow directions in handling this material. Thus education in all mechanical means in preventing blindness is the answer to one phase of the problem.

DR. MORRIS DAVIDSON, New York: Dr. Kuhn's plea for an industrial orientation of ophthalmology is timely and desirable. The "almost double" incidence of uncorrected visual acuity defects in table 1, of which four fifths were found correctible to almost normal, the lack of parallelism with the incidence of corrected visual acuity, particularly if qualified by "with whatever correction was worn," may simply mean that the civilian population is not receiving the same eye care in 1943 that it did in 1940. That depth perception shows less deterioration in table 1, and muscle balance less deterioration in table 2, would also suggest the same explanation. There is no doubt that there is a serious problem urgently calling for a solution. The problem is the organization of effective eye care for the industrial population. We need first a program of special training for such work, which should provide for departments of industrial ophthalmology in all graduate schools of ophthalmology and for the development of a standard technic of examination and a standard organization of ophthalmic care in industry. Educational work with industrial management is also needed to make it realize that visual defects undoubtedly account for a considerable proportion of accidents and that "carelessness," to which 50 per cent of accidents are attributed, is also partly the result of undiscovered visual defects among the industrial workers. Industrial plants with tens of thousands of employees do not realize the necessity of employing full time ophthalmologists to look after the workers' eyes properly. Until we have perfected our facilities for the training of more ophthalmologists, we may take advantage of the abundance of optometrists and incorporate them into the organization of industrial eye care as technical assistants to ophthalmologists in charge.

DR. HEDWIG S. KUHN, Hammond, Ind.: Dr. Terry's mention of the difficulty of exact determination of minimal visual standards for a given occupation is quite true, but we do not need to start with exact determinations. We can greatly assist in placement if we do such simple things as eliminate all persons who lack depth perception from the lists of prospective crane operators, power machinists, tractor drivers and the like. The factor of superior mental ability is always the margin of safety, but that would not be enough safety to avoid trouble in putting a color blind person on a dangerous job depending on color discrimination. These rough groups of the primary visual skills can at least be a first step forward in developing the truly scientific minimal visual standards Dr. Terry speaks of. Dr. Davidson goes to the root of the entire problem in indicating the lack of instruction that physicians have prior to practice and the lack of instruction in industrial ophthalmology in graduate schools.

HUMAN INFECTION WITH VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS

A REPORT ON EIGHT CASES OF INFECTION ACQUIRED IN THE LABORATORY

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The importance of the viruses of western [1] and of eastern equine encephalomyelitis [2] in the causation of human disease is now well established.

Meyer,[3] shortly after the discovery of the western equine virus in 1930, described the occurrence of encephalitis in 3 persons who had cared for sick horses and he voiced the suspicion that human infections with this virus may occur.

In 1938 Eklund and Blumstein,[4] investigating the occurrence of 6 human cases of encephalitis in Minnesota, found neutralizing antibodies to the western virus in the blood serum in 1 of 3 cases tested, and in the same year Howitt [5] isolated the virus from the brain in a human case of encephalitis.

In 1941 the largest epidemic of encephalitis ever recorded occurred in and around North Dakota,[6] which alone had 1,080 cases with ninety-six deaths, and the causative agent was shown to be the western equine virus.

An outbreak of human encephalitis, proved to be due to the eastern virus,[7] occurred in Massachusetts in 1938 [8] and resulted in eight deaths among the 30 cases reported (Feemster [9] refers to 38 cases).

The third member of the trilogy of equine encephalomyelitis viruses, immunologically distinct from the other two, is the virus of Venezuelan equine encephalomyelitis.[10] This virus appears to have received very little attention from veterinary or medical investigators, and the available information is meager and limited in scope. As far as we are aware, no instances of human infection with this virus have been reported from Venezuela or contiguous areas.

While this manuscript was in preparation, the report of Casals, Curnen and Thomas [11] describing 2 cases of human infection, both mild and acquired in the laboratory, reached our hands. It is our purpose in the present communication to describe 8 human cases of laboratory infection with the Venezuelan virus in which the clinical course of the disease varied from a comparatively mild illness to a severe infection with manifestations of central nervous system involvement. All 8 cases were proved immunologically to be due to the Venezuelan virus, and in 6 the virus was recovered.

EPIDEMIOLOGY

During the course of investigations on the causation of encephalitis following vaccination against yellow fever [12] it became desirable to make comparative studies on certain neurotropic viruses, and for this purpose an isolation section was temporarily established in the Yellow Fever Research Laboratory. It is located on the second floor of the building to segregate it from the laboratories (third floor) devoted entirely to yellow fever investigations. The section is quartered in a single large room, one portion of which contains the usual basic laboratory apparatus and supplies and the rest provides space for mice. It began to function in September 1941, the original personnel consisting of two physicians, E. H. L. and H. K., two technical assistants, G. D. and L. P. da S., and two animal caretakers and general utility men, C. P. O. and another person, A. F., who, at the time the laboratory infections reported here occurred was away on vacation, remained well and is therefore not considered further. J. D. B., technician, joined this group in September 1942, and J. S. R., animal caretaker, was added in January 1943.

To keep the foreign viruses within the confines of the isolation section, a number of precautions were taken. No employee other than the section's personnel was permitted to enter, under threat of immediate dismissal. All the viruses worked with were passaged, desiccated and stored in locked steel boxes in the section. No animal received in the section was permitted to leave alive, and all dead animals, cage refuse, floor sweepings and so on were collected in special receptacles. These containers with their contents were immersed in tanks of cresol solution for a minimum of one-half hour, but usually several hours, were withdrawn and allowed to drain, and the refuse was then incinerated. Mouse boxes were disinfected by similar

From the Laboratory of the Yellow Fever Research Service, Rio de Janeiro, Brazil.

The work on which these observations are based was carried out under the auspices of the Serviço de Estudos e Pesquisas sôbre a Febre Amarela (Yellow Fever Research Service), which is maintained jointly by the Ministry of Education and Health of Brazil and the International Health Division of the Rockefeller Foundation.

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8. Wesselhoeft, Conrad; Smith, E. C., and Branch, C. F.: Human Encephalitis: Eight Fatal Cases, with Four Due to the Virus of Equine Encephalomyelitis, J. A. M. A. 111:1735-1741 (Nov. 5) 1938. Farber, Sidney; Hill, Allen; Connerly, Marion L., and Dingle, J. H.: Encephalitis in Infants and Children Caused by the Virus of the Eastern Variety of Equine Encephalitis, ibid. 114:1725-1731 (May 4) 1940.

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10. Kubes, V., and Rios, F. A.: The Causative Agent of Infectious Equine Encephalomyelitis in Venezuela, Science 90:20-21 (July 7) 1939.

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12. Fox, J. P.; Lennette, E. H.; Manso, C., and Sousa Aguiar, J. R.: Encephalitis in Man Following Vaccination with 17D Yellow Fever Virus, Am. J. Hyg. 36:117-143 (Sept.) 1942.

immersion and then scrubbed with soap and water. All glassware and instruments were boiled in covered enamelware containers, which, when cool, were doused liberally with cresol solution before delivery to the sterilization room. Tables and work benches were routinely washed with cresol solution at the beginning and end of each day's work and before and after use during the day. All manipulations of infectious material were done over cresol soaked towels spread on the table or bench.

During the past two years, ten different neurotropic viruses have been worked with at one time or another, and the precautions outlined appear to have been adequate.

On Aug. 18, 1942 a strain of the Venezuelan equine encephalomyelitis virus was received from Dr. Raymundo Cunha of the Institute de Biologia Animal, Rio de Janeiro, who originally obtained it from Beck and Wyckoff.[13] The virus was immediately passaged, and up to June 26, 1943 it had been worked with on fifty-two separate occasions, chiefly passages to secure source material for experiments and for animal immunization. On June 26, 1943, the fifty-third occasion, 120 suckling mice were inoculated, according to the technic used many times before, to serve as infected individuals in an experiment on contact infection. The noteworthy feature of this experiment, which distinguished it from all previous ones, lay in the unusually high frequency with which, for various reasons, the contaminated mouse boxes were handled. About 80 per cent of the inoculated animals died within 36 to 48 hours and the majority were partially eaten by the mothers. Since the virus is present in the brain in high concentration and persists in the blood up to the time of death, there is every reason to believe that the wood shavings and dust in the boxes were heavily contaminated by the blood and carcasses of the partially devoured animals. The mice in each box were inspected two or more times daily to transfer sick animals to other boxes, to detect signs of illness in noninoculated contacts and to remove dead animals. Because of the small size of the experimental mice, it was necessary to comb through the shavings with forceps to find them. Such agitation of the contents of the boxes raised a fine and, in sunlight, perceptible cloud of dust, to which the examiners were exposed for an appreciable period at least twice daily.

The first human infection appeared on June 30 in J. S. This person was a technician in the ornithology section, was well trained in the handling of yellow fever virus and had been permitted the facilities of the isolation section for inoculation of birds with the eastern equine encephalomyelitis virus. He had worked with the eastern equine virus on numerous occasions from Feb. 26, 1943 until June 26, 1943. On the latter date he handled for the first time a preparation of the Venezuelan virus and inoculated a number of birds. The nature of the experiment required him to spend several hours daily in the isolation section for the succeeding several days. He was therefore subjected for a considerable period of time to the same environmental conditions as the permanent staff of the isolation section; 2 persons who assisted him in the bird inoculations were exposed to the virus on that occasion, did not enter the section again and did not become ill.

The second case of illness appeared on July 1 and was followed by 3 more on July 2; the sixth appeared on July 5. Only 3 members of the section's personnel escaped infection—A. F., who at the time of the experiment was on vacation, and H. K. and E. H. L., both of whom, owing to the press of other work, entered the section only intermittently and for relatively brief intervals.

The experiment was repeated on a larger scale on July 10, and this time both H. K. and E. H. L. examined the mice and effected the necessary switches of animals between boxes; H. K. became ill on July 13, E. H. L. on July 14.

The occurrence of the cases in two groups, each after an experiment of the type described, points to the presence in each experiment of a common source of infection. This source, for the reasons mentioned, is strongly suspected to have been the contaminated dust in the mouse boxes, and we are inclined to believe that the infections were acquired by the respiratory route.

Since Casals [11] and we have found the virus present in throat washings, it is not impossible that infection can be transferred through the medium of infected droplets. In the present series G. D. (patient 6) may conceivably have acquired his infection in such a manner, since he became ill 72 to 120 hours after patients 1-5, in all of whom the disease had its onset within 48 to 96 hours after the first exposure to contaminated dust.

Patients 7 and 8 likewise became ill 36 to 48 hours after their first exposure in the second experiment. With a virus as infectious as the Venezuelan equine virus, it appears reasonable that a short incubation period, dating from the experiment, is more probable than a long one, which would have to be assumed if these persons acquired their infection from any of the first groups of patients; the possibility that the latter occurred, however, cannot be ruled out.

REPORT OF CASES

CASE 1.—J. S., a white man aged 30, a technician, as explained, was not permanently attached to the staff of the isolation section. About 3:30 p. m., on June 30, 1943 he began to feel cold and noted that his arms were covered with gooseflesh and that his face felt hot. Before leaving the laboratory at 4:30 p. m. he expressed the belief that he was coming down with an attack of grip because he then had a generalized body ache and a beginning frontal headache. During the evening the body pains increased in intensity and were stated to be especially severe over the shoulders, lumbar region and backs of the legs. The headache became almost unbearable. He felt continually nauseated and vomited several times during the night. Despite the use of several blankets he was unable to relieve his feeling of chilliness; he sweated profusely but did not shiver. No medication was taken.

He awoke on July 1, after having had little sleep, feeling much worse than on the preceding day. He states that the muscle pains were so severe and the malaise so pronounced that every movement was made only with considerable effort. The headache persisted in undiminished intensity. No symptoms of respiratory infection were present. He reported for duty as usual but, because he appeared quite ill, was sent home and urged to consult a physician. He went to bed, and acetylsalicylic acid and acetophenetidin 0.5 Gm. of each every four hours were prescribed by his physician. Because of his fever and thirst he drank large amounts of fruit juices and water despite the nausea, which left him without desire for other foods. In the late afternoon, although still weak, he felt somewhat improved, chiefly because the muscle pains had decreased considerably and his headache had diminished slightly. The nausea continued, however, and during the night he vomited two or three times. Profuse night sweats were again present and he spent a restless night.

July 2 the patient continued with his medication and on the whole felt much better. However, his neck and shoulders were sore and he moved his head as infrequently as possible because

13. Beck, C. E., and Wyckoff, R. W. G.: Venezuelan Equine Encephalomyelitis, Science 88:530 (Dec. 2) 1938.

of the exacerbation of the headache such movements produced. The muscular pains were almost gone, and the nausea had disappeared. He still felt weak and had no desire for food. He believes he also had some elevation in temperature because his face and body felt extremely hot, and he was unable to satisfy his thirst. No symptoms of respiratory infection were present.

On July 3 he reported for duty, stating that aside from feeling weak he felt much improved and capable of working the half day (Saturday). It was observed that he held his head rigidly and avoided lateral movements; on questioning he denied the presence of rigidity and explained the position as one of "defense to prevent exacerbations of the headache induced by the smallest movements" (defesa para não exacerbar a cefaléia que se torna acusada aos menores movimentos). This was regarded with suspicion, but, since he stated that he felt so much improved that he had stopped medication and appeared cheerful and mentally alert, he was permitted to work. During the next three days he continued to hold his head somewhat stiffly. The headache persisted, but in mild, bearable form. His strength returned rapidly, he became fatigued less quickly, and on July 7 he felt that he had recovered, since the headache was gone and he moved his head freely. By July 9 his strength and appetite were back to normal.

Case 2.—C. P. O., a white man aged 34, an animal caretaker and general utility man, began to be ill at 6 p. m. on July 1, 1943, when he had a sudden violent chill. Attacks of shivering and chattering of the teeth, lasting about one minute, occurred at five to ten minute intervals for the next hour. Shortly after 7 p. m. he took one tablet (0.325 Gm.) of acetylsalicylic acid and about 100 cc. of a hot infusion of garlic and went to bed but could not sleep. Between 9 and 10 p. m. a severe headache, localized between the eyes, set in, and he began to complain of photophobia. He felt hot, perspired freely and was unable to sleep most of the night because of the headache. About 4 or 5 a. m. he began to complain of generalized muscle aches and pains, especially severe in the lower part of the legs.

July 2 he awoke late in the morning with a strong photophobia, intense body aches and an almost unbearable headache. He felt so tired and weak that he remained in bed the whole day, but because of the headache he was able to sleep only intermittently and for short intervals. He felt hot but did not perspire, nor was the fluid intake any greater than normal. No food was taken during the day. Nausea was absent. He states that no symptoms of respiratory infection were present.

He awoke on July 3, after sleeping fitfully during the night, to find that the photophobia had disappeared and that the headache and body aches had diminished appreciably; pain in the calf muscles was still strong, however, so that he walked as little as possible and avoided climbing stairs. He went to the laboratory but, because of asthenia and leg pains, performed all his routine tasks, as far as feasible, while seated. Toward the middle of the afternoon the muscle pains and the headache diminished in intensity and he felt much better. He was without appetite and ate nothing the entire day. He slept well the whole night.

On July 4 he awoke completely free from his headache. Slight pains in the calf muscles were still present, but very mild, and during the afternoon practically disappeared. He still felt weak and had no appetite, although he felt hungry. He slept soundly that night. On July 5 he felt much improved and had no complaints except that he still felt weak and tired easily. He ate well for the first time since the onset of illness. During the next few days the asthenia disappeared and he was able to work as usual.

Case 3.—J. S. R., a Negro aged 28, an animal caretaker and general utility man, was well until about 10 a. m. on July 2, 1943, when he suddenly felt cold and dizzy. Shortly thereafter he developed a frontal headache, which by 2 p. m. was so severe that he was barely able to continue with his work. His temperature at noon was 100.4 F., at 2 p. m. 101.4 F. With the appearance of the headache he began to feel dizzy at frequent intervals. By 4:30 p. m. his headache was so severe that in order to escape sudden exacerbations in its intensity, produced by sudden movements or jarring of the body, he walked slowly and carefully. His temperature at this time was 102.2 F.

He arrived home at 5 p. m. and complained that his head felt so heavy that it seemed ready to fall off his body and that his legs were so weak he could hardly stand. He felt cold and shivered, although his body was hot. Food was refused and he went to bed at 6:30 p. m. after taking two tablets of veganin (each tablet contains codeine phosphate 0.01 Gm., acetylsalicylic acid 0.25 Gm. and acetophenetidin 0.25 Gm.). He slept poorly and was troubled with a profuse night sweat.

He awoke on July 3 feeling about the same as on the preceding day and remained at home. Veganin medication was continued, two tablets being taken every four hours. He felt weak, the headache continued with unabated severity, and sudden movements of the head produced vertigo and a slight nausea. Despite a distaste for food, he forced himself to eat. Muscle aches and pains were absent and there were no symptoms of upper respiratory tract infection. He slept well during the night, perspiring, but not as much as on the previous night. The chilly sensations had disappeared.

During the next three days the night sweats and the headache (still frontal) diminished and on July 7, when he returned to the laboratory, had disappeared. His appetite improved and his strength returned gradually, and by July 12 he felt that he was back to normal.

Case 4.—J. D. B., a white man aged 34, a laboratory technician, awoke on July 2, 1943 with a frontal headache and pains in the calf muscles of both legs but did not feel too sick to work all day in the laboratory. No other symptoms were present. He slept well and on July 3 went to the laboratory as usual and worked until noon (Saturday). The headache and leg pains were still present and still as strong as on the preceding day. Toward noon his shoulders and back began to ache, and he felt so weak that he went to bed as soon as he arrived home. He had no appetite and ate practically nothing all day. His condition remained essentially the same on July 4, when he again worked half the day (Sunday). On July 5 the muscle pains were gone and only a mild headache was present. The anorexia persisted. He worked all day and felt much improved. On July 6 his headache disappeared, his appetite returned and, aside from the asthenia, he had no complaints.

Case 5.—L. P. da S., a white man aged 29, a laboratory technician, about 2 p. m. on July 2, 1943 began to feel tired and complained of aches in the back and the legs; he attributed this to the fact that he had worked rapidly and intensively all the morning without pause. Later in the afternoon he developed a bothersome frontal headache, malaise and a generalized body ache. He left the laboratory at the usual hour, 4:30 p. m., and in the belief that he was in the initial stages of grip he stopped at a drugstore, where he received an intramuscular injection of one ampule each of "Gripion" (quinine chlorhydrate, urethane, sodium nucleinate and cacodylates of sodium, strychnine and guaiacol) and of vitamin C. On arrival at home he took a cup of tea and one tablet of "Melhoral" (butanoic-o-oxybenzoic acid 0.5 Gm. and caffeine 0.05 Gm.) and went to bed. His face was hot and flushed, and his whole body felt warm. The headache had now become severe and he complained of photophobia and of pain behind the eyeballs. He was restless and slept little all night.

On July 3 he was so weak that it was with great difficulty that he got out of bed and dressed himself. The headache and muscle pains of the lower back and legs persisted in undiminished intensity. No symptoms of upper respiratory tract infection were present. The feverish feeling was now replaced by a continuous sensation of cold. He reported at the laboratory at the usual hour, but his general appearance, especially the ashen color of his face, was so alarming that he was immediately sent home. He was urged to call in a physician but did not do so. On arrival home he took a cup of tea and a piece of bread, the only food taken all day. In the late afternoon his headache ameliorated somewhat, but the muscle pains continued with unabated severity. He slept well that night and the next day, July 4, he found the headache and muscle pains gone. He was so weak that he remained in bed all day and ate but little.

On July 5 he felt much better and was able to work all day. He was pale and weak and had little desire for food. By July 8 he considered himself to be as well as before his recent illness.

CASE 6.—G. D., a white man aged 29, a laboratory technician, began to be ill on July 5, 1943, when at about 10 a. m. he developed a headache, and muscular aches and pains appeared in the lumbar region and in the arms and legs. At 11 a. m. he found his temperature was 100.6 F. and he took one tablet (0.325 Gm.) of acetylsalicylic acid. His symptoms were relieved from about noon to 1 p. m. but around 2 p. m. returned with increased intensity. His head felt as though a heavy weight had been placed on it and ached over the centroparietal regions. Strong photophobia appeared late in the afternoon. At 5:30 p. m. he had a chill, after which he felt continually cold, although covered with blankets. Because of the severe headache, muscle pains and chilly sensation he slept but little. The chilly sensation disappeared toward morning.

July 6 the headache and body pains persisted with the same intensity. He felt so weak that he remained in bed until evening; attempts to arise at noon were attended by nausea and vertigo. Very little food was taken during the day. Toward evening he felt somewhat better—the headache became bearable, the photophobia disappeared and the muscle pains, now much decreased in severity, were present only over the shoulders and in the thighs. He slept quite well and on July 7 he awoke feeling so much improved that he reported for work at the laboratory. He still felt tired and had no appetite but was cheerful because his headache had disappeared and the muscle pains were so mild as not to be bothersome. A generalized headache appeared and disappeared several times during the day, however, but was so ephemeral that no attention was paid it.

During the next three days his strength and appetite returned to normal. Periodic headaches, always slight, were stated to occur on July 8 and 9 and disappeared entirely July 10.

CASE 7.—H. K., a white man aged 27, a physician, whose illness had its onset July 13, 1943 about 10 p. m., had a sudden violent chill, which was followed by several attacks of shivering 15 to 20 minutes apart and 1 to 2 minutes in duration. At midnight he took 0.4 Gm. of aminopyrine and went to bed. He complained of tachycardia and slight dyspnea, was restless and was unable to sleep most of the night. About 5 a. m. July 14 a dull ache appeared over the occiput and during the next three hours became severe and radiated to the sides of the head. He ate a meager breakfast and went to the laboratory. About 8:30 a. m. sharp muscle pains appeared in the lumbar region. At 9:30 a. m. one tablet of veganin was taken; some amelioration of the headache and backache was obtained until about 11 a. m., when both returned with greater intensity and he began to feel drowsy. After a specimen of blood and a throat washing were taken, he went home to bed. At 2 p. m. his temperature was 101.8 F., the pulse rate 120 and the headache almost unbearable. He took another tablet of veganin, without relief. His drowsiness increased and photophobia appeared. He began to feel hot, and at 5 p. m. his temperature was 103.6 F., pulse rate 128. About 6 p. m. he began to perspire profusely and felt some relief from his symptoms. At 8 p. m. his temperature was 101.0 F. Shortly thereafter he was seen by a physician. Physical examination revealed nothing aside from a slightly reddened pharynx and a tachycardia. The neurologic examination was completely negative. Acetyl-p-amido-phenyl salicylate 0.65 Gm. three times daily was prescribed.

At 7 a. m. July 15 his temperature was 102.6 F. and pulse rate 108. The headache was now frontal and still severe, and the photophobia was accentuated. There was no change in the muscle pains. No signs of upper respiratory infection were noted. He was drowsy but did not sleep much. Desire for food was absent, but he drank large amounts of fruit juices and mineral water. At noon his temperature was 101.8 F., pulse rate 100, and the pains in the back were less severe. At 7 p. m. the temperature was 101.8 F., pulse rate 108 and he felt somewhat improved. He slept well all night and again perspired heavily.

On July 16 he felt much better. The drowsiness, photophobia and backache had disappeared. The headache, mild in the morning, was practically gone by evening. His temperature during the day was between 99.4 and 99.6 F. July 17, although weak, he was in good spirits, alert and able to eat. All his symptoms had disappeared. His temperature during the day was between 98.0 and 98.4 F. Medication was discontinued.

On July 18 he suffered a relapse. His temperature at 7 a. m. was 100.8 F. and severe frontal headache, low back pain, photophobia and intense pain over the right mastoid area were present. Acetyl-amido-p-phenyl salicylate medication was resumed. At noon his temperature was 101.2 F. and at 5 p. m. it was 99.4 F. Except for the headache, all his symptoms disappeared by late evening and he was able to sleep all night.

July 19 his temperature returned to normal. Only a mild frontal headache was present, and this persisted until July 23. Between July 19 and July 23 his strength returned and his appetite improved, and on July 24 he resumed his duties at the laboratory.

At the present time he has a slight intention tremor of the hands, which is gradually disappearing, and an annoying insomnia, which does not permit him to sleep after 4 or 5 a. m. regardless of the amount of sleep obtained before that time.

CASE 8.—E. H. L., a white man aged 35, a physician, became ill on July 14, 1943, when a slight generalized malaise appeared during the morning and persisted unchanged throughout the day. About 3 p. m. he developed a mild generalized headache. On July 15 he awoke with a severe frontal headache sharply localized between the eyes (for the next ten days the headache persisted in this area and was always so sharply circumscribed that he could almost delineate the area of ache). Body aches and pains were present and in the shoulders and lower back were severe. A slight pharyngeal irritation was present. In the belief that his symptoms were due to a developing grip he began to take large quantities of fluid. By 10 a. m. he felt so ill and weak that he left the laboratory and went to bed. His temperature was 103 F. Acetylsalicylic acid 0.65 Gm. was taken every three hours with but little effect on the muscular pains and none on the headache. A persistent nausea was present and, aside from the breakfast, he ate nothing. During the night the severity of the headache increased to the point where it was almost unbearable and he was unable to sleep most of the night.

The next day, July 16, he went to the laboratory as usual. He noted that his face was hot and flushed, although he continually felt cold. The temperature was 102.5 F. Attacks of nausea occurred at frequent intervals and he had no desire to eat. Several times during the day he was forced to interrupt his work momentarily because of sudden transient attacks of vertigo. Photophobia was absent. Muscle pains were strong, he felt tired and weak and he had to rest frequently. He was also drowsy but attributed this and his fatigue to the lack of sleep the previous night. In an effort to ameliorate the headache, which by evening had become excruciating, he switched to Anacin (acetophenetidin, quinine sulfate and caffeine) two tablets (0.65 Gm.) every three hours. He retired at 7 p. m. but because of the headache slept very little, even though he was tired and drowsy. The next day, Saturday July 17, he went to the laboratory although he felt so tired and weak that every movement demanded considerable effort. Medication during the night having had no effect on the headache, he discontinued it. The muscle pains were less severe in the back and shoulders but were worse in the legs, especially the calf muscles. The nausea disappeared, but the anorexia persisted. In the laboratory he felt so ill that he was unable to do any active work but depended entirely on the technical staff to do it under his supervision. At 1 p. m., after partaking of a little toast and weak tea, he went to bed and slept soundly for twenty-two hours.

He awoke on July 18 much refreshed but very weak. He was entirely free from muscle pains, and the headache, which had diminished considerably, was bearable; during the day its intensity decreased gradually, but it did not disappear. He remained seated most of the day and was comfortable as long as no activity was attempted, since he fatigued quickly. The anorexia continued, but he forced himself to eat a little. At 5 p. m. he returned to bed and slept soundly through the night.

July 19 he arose to find that he had only a slight headache. He was alert, was in good spirits, and worked all day although he still felt weak. His appetite began to return. On July 20 his condition was about the same.

On July 21 he awoke feeling well physically but with a vague sense of uneasiness and apprehension. He ate his usual breakfast and went to the laboratory. About 10 a. m. he began to feel cold, and within half an hour severe aches appeared in the legs, back and shoulders. His head felt heavy, he was sleepy, and at noon the headache, which for the past three days had been minimal, returned in its full excruciating intensity and again was localized between the eyes. Nausea and vertigo appeared with the headache, and he was unable to eat his lunch. By 2 p. m. he was so ill that he was taken home. His temperature was 103.5 F. His face had an ashen gray pallor, and he had a persistent sensation of chilliness, especially in the hands and feet, even when covered with blankets. He complained of a pounding heart, slightly labored breathing and photophobia. He was irritable, responded to questions brusquely, refused to tolerate any one in his room and demanded to be left in peace. After his room was darkened he almost immediately went to sleep and remained in a somnolent state all that day. At 7 p. m. he vomited a large amount of bile stained mucus and again went to sleep. He slept almost continuously day and night for five days but was easily aroused when spoken to or by unusual outside noises. During the course of conversations he remained awake for whatever length of time was required and then went back to sleep. At no time was there any evidence of mental confusion; he himself was aware of his somnolent state and even observed that his breathing seemed irregular and that he sighed frequently. When awake he usually complained most bitterly of his headache and of pains in his back and legs. During the five days of somnolence his temperature ranged from 101.5 to 103 F. and he subsisted only on tea and toast; the sight or smell of any other food induced nausea.

On July 26, twelve days after the onset of the first symptoms and after five days of somnolence, he awoke cheerful, alert and exultant that his headache was gone. The muscle pains were also gone, and except for a soreness in the shoulders and back he felt comfortable and ate a hearty breakfast. His temperature was 99.8 F. A weight loss of 5 Kg. had occurred during the twelve days of illness.

On July 27 he resumed his work at the laboratory and was able to work all day, although he became so fatigued that he had to rest frequently. In the course of the next week his strength and appetite gradually returned. As in case 7, insomnia and a fine intention tremor are present as sequelae but are gradually disappearing.

ISOLATION OF A FILTRABLE AGENT FROM SIX PATIENTS

The entire personnel of the isolation section had been bled on July 3, at the time the first infections occurred, and the serums were stored in the refrigerator.

When patient 7 became ill he was bled on July 14, the second day of illness, and his serum as well as the July 3 serum specimens from patients 1, 2, 4, 5 and 6 were inoculated into mice. Patient 8 was bled on July 15, and the serum was injected into mice the same day.

Each serum was injected intracerebrally in 0.03 cc. amounts into 12 albino Swiss mice of 21 to 23 days of age. None of the mice inoculated with serum from patient 6 showed any detectable signs of illness during a 14 day observation period and were discarded; since this serum was taken 2 days before the onset of symptoms, demonstrable circulating virus probably was not present in his blood. This finds some support in the fact that the serum of patient 8, taken on the second day of illness, contained so little virus that only 1 mouse behaved suspiciously 72 hours after inoculation; this mouse was killed, and the virus was recovered from its brain by passage. The remaining 11 mice showed no visible evidence of illness during a 21 day observation period. The majority of the mice inoculated with serum from patients 1, 2, 4, 5 and 7, however, were found dead or dying 48 hours after inoculation.

The sick mice were killed and their brains were removed, weighed and made into a 10 per cent suspension in nutrient broth containing 10 per cent of normal sheep serum. The supernatants obtained after centrifugation for 15 minutes at 1,500 revolutions per minute in an international electric centrifuge equipped with an angle head were drawn off and inoculated intracerebrally in 0.03 cc. amounts into groups of 12 mice. Bacteriologic cultures made by inoculating 1.0 cc. amounts of the supernatants into tubes of broth and deep agar (Veillon's medium) and streaking blood agar plates were sterile at the end of seven days. Mice sick at the second passage were killed and the brains were removed and made into a 20 per cent suspension in 10 per cent normal sheep serum broth and centrifuged as before. The supernatants were ampuled in 0.5 cc. amounts and desiccated from the frozen state over sulfuric acid.[14]

A throat washing in nutrient broth was collected from patient 7 on the second day of illness and was immediately inoculated intranasally in 0.05 cc. amounts into 12 mice. Four days after inoculation all the animals were excitable and appeared sick. Four of the mice were killed. The lungs were examined and found to be normal on gross inspection. The brains were therefore removed and made into a 20 per cent suspension in serum broth, and the supernatant obtained after centrifugation was desiccated as before. The next day 6 mice were found dead; on examination the lungs of these and of the remaining 2 sick animals showed no consolidation or abscesses.

As bacteriologic cultures made of the seven infectious agents were consistently negative, these agents were considered to be viruses, most probably one of those worked with in the laboratory. To narrow down the field of possible offenders, so that final identification could be accomplished with an economy of time, labor and money, two approaches, viz. filtrability of the agents and their pathogenicity in animals, were used. Depending on whether the infectivity of the filtrates was abolished, reduced or unaffected as compared with unfiltered preparations, certain of the viruses in the laboratory could be excluded from consideration. In addition, the pathogenic activity of the virus in guinea pigs and/or rabbits, or its failure to infect either, would permit definitive exclusion of certain viruses.

One ampule of each of the seven strains was rehydrated with broth and the contents were inoculated intracerebrally into mice. The next day, when signs of illness were present in most of the animals, the brains were removed, made to a $10^{-1.0}$ suspension in sheep serum broth and centrifuged as described. The supernatants were drawn off, diluted to $10^{-2.0}$ with serum broth, and a 20 cc. aliquot was filtered through a Seitz EK pad previously prepared by passing 20 cc. of serum broth through it.

Serial tenfold dilutions of each of the seven filtrates were made and inoculated intracerebrally in 0.03 cc. amounts into mice, four for each dilution. The hundredfold dilutions of the filtrates ($10^{-4.0}$ dilution of the original brains) were inoculated into pairs of guinea pigs and rabbits, one of the pair receiving the inoculum by the cerebral route, the other by the intraperitoneal route; 0.2 cc. was injected intracerebrally into both guinea pigs and rabbits, and 0.5 and 1.0 cc. were injected intraperitoneally into guinea pigs and rabbits respectively.

14. Lennette, E. H., and Fox, J. P.: Anticorpos neutralizantes para a amostra leste do virus de encefalomielite equina em equideos no Brasil, Mem. Inst. Oswaldo Cruz **38**: 85-92 (Feb.) 1943.

The 50 per cent mouse mortality end point titer [15] of the seven filtrates varied from $10^{-8.8}$ to $10^{-9.5}$ (based on the dilution of the original brain). These titers, practically identical with those obtained with crude suspensions of infected mouse brain, indicate that the infectious agents passed the filters without significant loss of infectivity; the ability to pass through an EK filter pad suggests a very small particle size. Aerobic and anaerobic cultures of the filtrates failed to show any bacterial growth during 10 days' incubation.

On the basis of the 50 per cent intracerebral mouse mortality end point titer of the filtrates and the volume injected, guinea pigs and rabbits received from 195,000 to 1,950,000 mouse minimum lethal doses intracerebrally; intraperitoneally, guinea pigs received from 487,500 to 4,875,000 mouse minimal lethal doses and rabbits received from 975,000 to 9,750,000 mouse minimal lethal doses. Following intracerebral inoculation, fever appeared in 12 to 24 hours and was followed by weakness, tremors, paralyses and death; guinea pigs died in from 48 to 108 hours and rabbits in from 60 to 132 hours, the averages being 80 and 93 hours respectively. The onset, development and progression of the disease were essentially alike in the two animals. The course of infection after intraperitoneal inoculation was similar to that seen after intercerebral inoculation, except that physical evidence of infection was slower in appearing and the time to death was longer; guinea pigs died in from 84 to 240 hours and rabbits in from 60 to 204 hours, the respective averages being 132 and 138 hours.

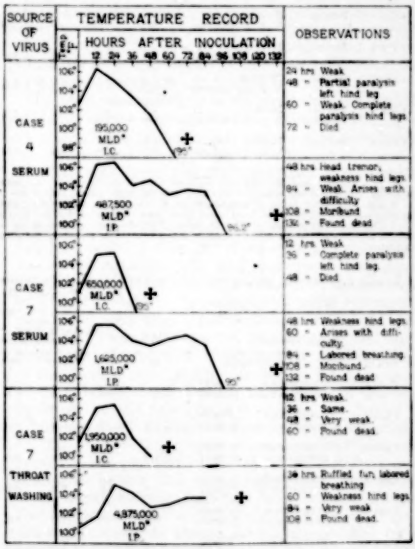
The chart presents the pertinent data on the course of the infection in guinea pigs inoculated with the viruses recovered from patients 4 and 7; the results are highly typical of those in the other test pigs and, except for the time factor, closely resemble those obtained in rabbits.

The rapidity with which these infectious agents, even in very high dilution, killed mice, and their high infectivity for guinea pigs and rabbits strongly suggested that we were dealing with a member of the equine encephalomyelitis group; because of the remarkable pathogenicity for rabbits, the Venezuelan virus was considered to be the most probable of the three.[16]

IDENTIFICATION OF THE INFECTIOUS AGENTS AS VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS

Based on the presumptive evidence that the infectious agents recovered from 6 patients were identical with the Venezuelan equine virus, neutralization tests were done with known Venezuelan equine encephalomyelitis rabbit immune serum and the seven viruses.

Infectious mouse brain desiccates of each virus were rehydrated and passed intracerebrally into mice. Forty-eight hours later sick mice were killed and the brains were removed, cultured and stored overnight in the freezing compartment of the refrigerator. The following day five bacteriologically sterile brains of each virus lot were weighed, ground to a 20 per cent suspension in 10 per cent normal sheep serum broth and centrifuged at 1,500 revolutions per minute for 15 minutes in an international electric centrifuge equipped with an angle head. A series of falling tenfold dilutions was made from the supernatant by serial transfer of 0.5 cc. amounts into 4.5 cc. of serum broth. To 0.2 cc. of undiluted rabbit serum, normal or immune, was added 0.2 cc. of the desired virus dilution, the tubes were well shaken and the contents were inoculated into mice at once; each mixture was injected subcutaneously in 0.03 cc. amounts into a group of 6 mice 3 days of age.[17] Table 1 shows the results of the test. The mortality ratios are given to show the number of mice which died or survived following inoculation of any serum-virus mixture and to furnish the data on which the 50 per cent mouse mortality end point titer of the viruses in the presence of normal and of immune serum was computed. The degree to which the immune serum was able to neutralize a virus is shown, under the heading "effective virus titer," by the differences in the logarithms for the lethal dilution end points of the virus in the presence of normal and of immune serum; the logarithmic differences in titer are expressed arithmetically in the last column as the number of 50 per cent mouse mortality doses of virus neutralized. It



Pathogenicity for guinea pigs of filtrable agents isolated from patients 4 and 7. +, minimum lethal doses expressed as total number of 50 per cent intracerebral mouse mortality doses contained in the volume of inoculum administered.

15. Reed, L. J., and Muench, H.: A Simple Method of Estimating 50 Per Cent End Points, Am. J. Hyg. **27**: 493-497 (May) 1938.

16. Webster and Wright [7] consider the rabbit, unless massive doses are used, to be much less susceptible (±) than the guinea pig (++) to the eastern virus, while Mitchell and Walker (Canad. J. Comp. Med. **5**: 314 [Nov.] 1941) report rabbits refractory to intracerebral inoculation of the western virus. Kubes and Rios [8] found that rabbits were very susceptible to the Venezuelan virus and succumbed in from 72 to 96 hours after intracerebral inoculation; Lépine, Mathis and Sautter (Bull. Soc. path. exot. **34**: 115 [May-July] 1941) have also remarked on the high virulence of this virus for rabbits. Our routine procedure for immunization of rabbits against the eastern and western equine encephalomyelitis viruses is to administer intraperitoneally the whole of an uncentrifuged suspension consisting of one or two infectious mouse brains ground up in 10 cc. of isotonic solution of sodium chloride; the large majority of animals resist this dose of virus. With the Venezuelan virus, however, death of the animal is produced by intraperitoneal inoculation of 3 cc. of centrifuged virus supernatants diluted to $10^{-4.5}$, while smaller doses fail to immunize or produce a very poor immune response. We have succeeded in immunizing only 2 of 20 rabbits with living virus and now routinely use virus inactivated with 1 per cent formol.

17. The rationale and technic of this test will be presented in a forthcoming paper.

will be observed that from 79,000 to over 50,000,000 minimum lethal doses of virus, depending on the strain, were neutralized.

Since the Venezuelan equine virus rabbit immune serum had been previously tested by an identical technic and proved devoid of demonstrable neutralizing antibodies for the eastern and western viruses, its high neutralizing capacity for the seven human viruses was regarded as specific, and these were therefore considered to be identical with the Venezuelan virus.

All 8 patients were bled on July 31 to obtain a convalescent phase serum specimen; the interval from onset of symptoms to bleeding, therefore, ranged from 17 to 31 days. In those cases in which virus had been isolated from the acute phase blood specimen, recourse was had to a preinfection serum specimen taken from 2 to 13 days before onset of the illness.

TABLE 1.—*Results of Neutralization Tests with Venezuelan Equine Encephalomyelitis Rabbit Immune Serum and Viruses Recovered from Six Patients*

Virus Strain Tested			Mortality Ratio † in Three Day Old Mice Inoculated Subcutaneously with Serum Plus Virus Diluted										Effective Virus Titer	Number of 50% Mouse Mortality Doses of Virus Neutralized
Origin	Source	Type of Rabbit Serum * Used	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}	10^{-10}		
Case 1	Serum	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	3/6	0/6	$10^{-9.0}$	
		V. E. E. immune	6/6	6/6	2/6	0/6	0/6	0/6	0/6	...	...	...	$10^{-9.8}$	1,585,000
Case 2	Serum	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	1/6	0/6	$10^{-9.0}$	
		V. E. E. immune	6/6	6/6	0/6	0/5	0/4	0/6	0/6	...	...	...	$10^{-9.5}$	1,250,000
Case 4	Serum	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	0/6	0/6	$10^{-9.5}$	
		V. E. E. Immune	6/6	4/6‡	4/6‡	4/6‡	0/6	0/6	0/6	...	...	...	$10^{-9.8}$	79,430‡
Case 5	Serum	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	1/4	0/6	$10^{-9.5}$	
		V. E. E. Immune	6/6	2/6	0/5	0/6	0/5	0/6	0/6	...	...	...	$10^{-9.8}$	50,120,000
Case 7	Serum	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	4/6	0/6	$10^{-9.3}$	
		V. E. E. immune	6/6	3/6	3/6	4/6	0/6	0/6	0/6	...	...	...	$10^{-9.4}$	794,300
Case 7	Throat washing	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	4/4	0/6	$10^{-10.5}$	or >
		V. E. E. immune	6/6	6/6	4/6	2/6	0/6	0/6	0/6	...	...	...	$10^{-11.5}$	10,000,000
Case 8	Serum	Normal.....	...	...	...	...	6/6	6/6	6/6	6/6	6/6	6/6	$10^{-10.5}$	or >
		V. E. E. immune	6/6	6/6	2/6	1/6	0/6	0/6	0/6	...	...	...	$10^{-11.5}$	39,810,000

* The normal and the immune serums were obtained from the same rabbit prior to and after immunization with Venezuelan equine encephalomyelitis virus. Both were tested and proved free from antibodies to the eastern and western equine encephalomyelitis viruses.

† The mortality ratio is expressed by a fraction in which the numerator indicates the number of mice which died, and the denominator the number of mice which were inoculated (less those destroyed by the mother of the litter).

‡ The majority of the deaths in these dilutions were suspected to be nonspecific; however, since the animals died within the usual interval the deaths are considered as due to specific infection. It is possible, therefore, that the neutralizing potency of this serum is much greater than indicated.

TABLE 2.—*Results of Neutralization Tests with Venezuelan Equine Encephalomyelitis Virus and Serums Obtained from Eight Patients Before and After Illness*

Serum Specimen		Mortality Ratio * in Three Day Old Mice Inoculated Subcutaneously with Serum Plus Virus Diluted										Effective Virus Titer	Number of 50% Mouse Mortality Doses of Virus Neutralized
Origin	Day Obtained	10^{-1}	10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	10^{-9}	10^{-10}		
Case 1	Preinfection: 11 days	...	...	...	...	...	6/6	6/6	6/6	3/6	0/6	$10^{-9.0}$	
	Postinfection: 31 days	6/6	6/6	6/6	6/6	6/6	6/6	6/6	...	...	...	$10^{-11.5}$	31,600,000
Case 2	Preinfection: 12 days	...	...	...	...	...	6/6	6/6	6/6	6/6	0/6	$10^{-9.5}$	
	Postinfection: 30 days	6/6	2/6	0/6	0/6	0/6	0/6	0/6	...	...	...	$10^{-11.8}$	50,120,000
Case 3	Preinfection: 13 days	...	...	...	...	...	6/6	6/6	3/6	1/6	1/6	$10^{-9.7}$	
	Postinfection: 29 days	6/6	2/6	2/6	0/6	0/6	0/6	0/6	...	...	...	$10^{-10.9}$	15,850,000
Case 4	Preinfection: 13 days	...	...	...	...	...	6/6	6/6	6/6	6/6	0/4	$10^{-9.8}$	
	Postinfection: 29 days	6/6	6/6	6/6	6/6	6/6	6/6	6/6	...	...	...	$10^{-11.5}$	100,000,000
Case 5	Preinfection: 13 days	...	...	...	...	...	6/6	6/6	6/6	6/6	0/6	$10^{-9.5}$	
	Postinfection: 29 days	6/6	6/6	1/6	0/6	0/6	0/6	0/6	...	...	...	$10^{-10.6}$	7,943,000
Case 6	Preinfection: 2 days	...	...	...	...	...	6/6	6/6	6/6	6/6	1/6	$10^{-9.4}$	
	Postinfection: 26 days	6/6	2/6	0/6	0/6	0/6	0/6	0/6	...	...	...	$10^{-11.8}$	63,100,000
Case 7	Preinfection: 10 days	...	...	...	...	...	6/6	6/6	6/6	6/6	0/6	$10^{-9.5}$	
	Postinfection: 18 days	5/6	1/6	0/6	0/6	0/6	0/6	0/6	...	...	...	$10^{-11.5}$	100,000,000
Case 8	Preinfection: 11 days	...	...	...	...	...	6/6	6/6	6/6	4/6	1/6	$10^{-9.4}$	
	Postinfection: 17 days	6/6	6/6	6/6	6/6	6/6	6/6	6/6	...	...	...	$10^{-11.5}$	79,430,000

* The mortality ratio is expressed by a fraction in which the numerator indicates the number of mice which died and the denominator the number of mice which were inoculated (less those destroyed by the mother of the litter).

DEVELOPMENT IN PATIENTS OF NEUTRALIZING ANTIBODIES AGAINST THE VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS

In addition to the isolation from 6 of the patients of a virus identified as that of the Venezuelan type, further proof that the illnesses were caused by this virus was adduced by demonstrating that neutralizing antibodies for this virus appeared in the blood during convalescence.

A 20 per cent suspension in serum broth was made of 5 brains freshly removed from mice infected with known Venezuelan equine encephalomyelitis virus. This suspension was centrifuged and serial dilutions of the supernatant were made and mixed with undiluted serum and inoculated subcutaneously into 3 day old mice, the entire procedure following that described in the preceding section.

The results of the test are shown in table 2. It will be observed that the titer of the virus in the presence of serum taken prior to illness ranged from $10^{-9.0}$ to $10^{-9.8}$, which is the usual titration end point of the virus in menstruums devoid of neutralizing or inactivat-

ing capacities. In the presence of the convalescent serums, however, the titer of the virus was definitely reduced, as can be seen from the mortality ratios and from the logarithm of the virus dilution calculated to represent the titration end point. The difference between the titration end points represents the amount of virus neutralized, expressed in terms of minimum lethal dose in the last column of the table. In every case more than 99.99 per cent of the infectious activity of the virus was neutralized, as can readily be seen from the mortality ratios obtained for each pair of serums.

The appearance during convalescence of neutralizing antibodies in such high concentration that they were capable of inactivating from approximately 8,000,000 to 100,000,000 minimum lethal doses of the Venezuelan equine encephalomyelitis virus, coupled with the fact that in 6 patients the specific virus was recovered during illness, leaves no doubt that the human infections were due to this agent.

COMMENT

A striking feature of the cases reported here was the abruptness with which symptoms appeared and the rapidity with which they attained the peak of their severity. Except for the unusually severe headaches there was nothing characteristic about the symptoms, and most of the patients believed that they had an attack of grip or influenza, but cough, coryza, lacrimation, pharyngitis (except in case 8), laryngitis or other evidence of respiratory infection did not appear.

Common to all the cases was fever (subjective or objective), severe body aches and pains, especially intense in the calf muscles of the legs, and an almost unbearable persistent headache, unrelieved by the usual drugs and unanimously described as the worst in the patient's experience. Of 6 of the 8 patients the headache was frontal from its onset and remained thus localized throughout the course of the illness.

Compared with the 2 cases reported by Casals and his associates,[11] the course of the disease in all these patients was considerably more severe, even though definite differences in the severity of illness were present between the mildest and the severest cases. Cases 2 and 4 were the least severe, 3 and 6 next, and in 1, 5, 7 and 8 the illness was so severe as to give cause for alarm. All the patients were drowsy to a variable degree, but, owing to the inability of most of them to sleep because of the intense headache, its significance is difficult to assess. True somnolence appeared only in case 8. In cases 7 and 8 there was a period of remission with definite amelioration of the symptoms.

As shown in this communication and by Casals, the ability of the Venezuelan equine encephalomyelitis virus to infect man is beyond question. The apparent absence in Venezuela of human infections, frank or inapparent, is therefore puzzling, especially since encephalomyelitis has been prevalent in horses since at least 1936.[18] Because of the lack of information on the extent to which the Venezuelan and eastern equine viruses are disseminated among the human population residing in areas where these viruses are enzootic, a comparison of the relative infectivity and virulence for man of the three equine viruses is impossible. It may be worth noting, however, that no fatalities occurred among the 10 cases of laboratory infection produced by the Venezuelan virus, which is the most virulent for laboratory animals of the three equine encephalomyelitis viruses, while the western virus, the least virulent for laboratory animals, has caused two deaths among the 4 cases of laboratory infection recorded,[19] and the eastern virus has produced one nonfatal laboratory infection.[20]

There is an impressive body of epidemiologic evidence to show that the western equine virus is arthropod borne, and potential mosquito vectors have been reported for both the eastern [21] and the Venezuelan [22] equine viruses. According to the classification of encephalitides recently proposed by Hammon, Reeves and Gray [23] the encephalitides due to these agents, and in addition St. Louis encephalitis (mosquito borne), Japanese B encephalitis (mosquito borne), Russian fall-winter encephalitis (mosquito borne) and Russian spring-summer encephalitis (tick borne) would be classified as the "arthropod borne virus encephalitides." This would serve to distingush these encephalitides from those of the postvaccinal, postinfection and von Economo types and those due to rabies, trypanosomiasis and other conditions.

If, as is inescapable, it is admitted that the available evidence favors arthropod transmission of the equine viruses to the almost complete exclusion of transmission by contaminated food or water or by contact, it must be equally admitted that the abundance of evidence for the former means of transmission and its paucity for the latter are almost directly commensurate with the attention each has received. The western equine virus has been isolated from the nasal washings of horses [24] inoculated intracerebrally and from nasal washings of guinea pigs [25] inoculated intramuscularly, but according to Hammon and his associates [23] limited attempts to isolate the virus from nasal and throat washings, urine and feces of naturally infected human beings and horses have been unsuccessful. Against these negative results is the facility with which Casals and his associates [11] and we recovered the Venezuelan virus from the throat washings on the first and only attempt, so that of the 10 human cases of infection with this virus reported up to the present the specific virus has been recovered from the nasopharynx in 2. There is, therefore, every reason to believe that transmission by contact is possible; future investigations will have to assess the relative importance of the part such transmission plays in the epidemiology of human infections provoked by the equine encephalomyelitis viruses.

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TRACHEOTOMY IN BULBAR POLIOMYELITIS

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Most clinicians appear to doubt that tracheotomy could be useful in bulbar poliomyelitis, although Wilson [1] has stated that "in very carefully studied instances tracheotomy may save life." The results with 3 patients seen in the past two months have convinced me that the operation may be a very important procedure in this disease. Two were undoubtedly saved by it, and the third might have been had intervention been done ten minutes earlier.

The first of these illustrates most of the points to be raised and most of the difficulties encountered:

CASE 1.—A white man aged 36 had been admitted on Aug. 26, 1943 to the Evanston Hospital with a history of fever and malaise for four days, dizziness and stiffness of the neck for two days and difficulty in swallowing for one and one-half days. Spinal puncture with findings of 70 cells per cubic centimeter made the diagnosis apparently definitely bulbar poliomyelitis. He constantly spit up foamy saliva but did fairly well for four days. Then when a feeding tube could not be easily passed he was permitted to take some gelatin and fruit juice. This he gulped, then gasped, became incoherent and disoriented and had great difficulty in breathing.

Two hours later when I saw him he was semicomatose, cyanotic and breathing spasmodically with an interrupted shallow diaphragmatic respiration. He was in the postural drainage position, the tongue had been forcibly pulled forward, and much fairly thin secretion was being aspirated. A Flagg laryngoscope was introduced with difficulty, apparently caused in part by spasm, and the pharyngeal tissues and tongue were seen to crowd together. The larynx was observed to be open, and a pool of secretion found its gravity level in the larynx and trachea, so that, unless kept completely aspirated, inspired air had to be drawn through it. With the tongue held forward, first with a laryngoscope and later with a rubber airway and with constant aspiration the patient improved for a time. After about one hour respiration nearly ceased and he became completely unconscious.

A rapid median tracheotomy was done, cutting through a large congested thyroid isthmus. Breathing stopped at this stage for about three minutes. After aspiration by catheter through the tracheotomy wound and with manual artificial respiration, shallow intermittent breathing occurred hardly faster than the automatic rate but was not kept up without manual aid. The patient was then put in a Drinker-Collins respirator. The sponge-rubber collar was held distal to the tracheotomy tube by a "black iron" bar ¾ inch wide and ⅛ inch thick, bent 4 inches from the end at an angle of 40 degrees and fixed in place under the flange which held the collar. This was satisfactory except that removal of the inner tracheal cannula was difficult.

At 1 a. m. the patient was put in the respirator; at 1:30 the color was good and the pulse improved; at 1:45 he was conscious. The respirator was stopped at 3 a. m. for ten minutes at the patient's demand, and diaphragmatic respiration was of fair quality at first but quickly became irregular, and restlessness and cyanosis recurred. The respirator was then started and the patient rested and slept.

Secretion was profuse for several days, filling up to the lips and anterior nares, and was constantly aspirated through the tracheotomy tube, although the angle of postural drainage was maintained at 35 degrees. Fluid and electrolyte balance were maintained intravenously. Sixty thousand units of penicillin was given in thirty-six hours with no lowering of the temperature from 102 to 103 F. Thereafter a sulfadiazine level of 4 to 6 mg. per hundred cubic centimeters was maintained for one week. After four days feeding was by Levine tube, with the head raised and the respirator flat for one-half hour after feeding, followed alternately by three and one-half hours of postural drainage.

Four days after being put in the respirator the patient was left out for several hours. He became incoherent and cyanotic, and the pulse was poor. After some time again in the respirator, the patient rested and slept and awoke rational. Improvement was steady thereafter. Only gradually was the interval out of the respirator lengthened, and the patient was put back at the first sign of fatigue. After the eleventh day he was not returned to the respirator. Fourteen days after admission the patient felt much better, and on the sixteenth day he was allowed to eat breakfast, although a small piece of egg came out of the tube. Twenty-one days after operation the tracheotomy tube was corked, and two days later the tube was removed. One month after admission the patient left the hospital. His costal and diaphragmatic respiration seemed normal. He swallowed with little difficulty if he ate slowly. There was some residual paresis of the right shoulder and upper arms for which Kenny treatment was continuing.

CASE 2.—A white girl aged 12 years was seen on the third day of her bulbar poliomyelitis. She was cyanotic and restless, had a gurgling, shallow rapid respiration and was very apprehensive and uncooperative. She resisted gentle efforts at aspiration, although after this was done she improved for a few hours. When seen seven hours later she was unconscious, cyanotic and breathing out of rhythm and with great difficulty.

A rapid tracheotomy was done through the second and third tracheal rings and much thick mucus was aspirated. The patient improved slowly the first few hours but slept well after twelve hours. In twelve hours more respirations had become deep and fairly regular. Aside from occasional episodes of choking and cyanosis, improvement was rapid. She was given intravenous fluids for four days, then fed by gavage for three more. The tracheotomy tube was removed on the tenth postoperative day, and she left the hospital apparently well nineteen days after admission.

CASE 3.—A white boy aged 16 years was seen on the third day of illness. Because of rigidity and signs of irritation a diagnosis of meningitis had been made, but this was ruled out by spinal fluid findings including 70 cells per cubic centimeter. He had a nasal voice, and much glairy secretion accumulated in the pharynx. In twenty-four hours swallowing seemed impossible and breathing was shallow and irregular, but on deep aspiration of secretion by a catheter the breathing became more regular and deeper. At 9 p. m. the patient was put in the respirator with moderate improvement, although his own respiratory efforts were not well in rhythm with the mechanism. At 4 o'clock the next morning he was doing poorly with only jerky, shallow efforts as if intercostals, diaphragm and respirator were opposing one another.

Tracheotomy was decided on, and the patient was half taken out of the respirator for about ten minutes preparatory to moving to an operating room 50 feet distant, where I was preparing to operate. He became restless, vomited, foaming fluid appeared at the mouth, and respiration and the heart beat ceased. A stab tracheotomy was done, and about 15 cc. of thick mucoid secretion was aspirated from the trachea. The respirator was kept up for forty minutes but the patient could not be revived. He had apparently choked on his own secretion.

COMMENT

It is probably true that most poliomyelitis patients with respiratory difficulty will recover if seen early and if well treated by postural drainage, careful aspiration and intravenous fluids during the most acute stage. But if one visualizes what may happen in the respiratory tract, it would seem that tracheotomy might have great value in certain instances.

The normal secretion of saliva is from 1,000 to 1,500 cc. per day and may be increased in nervous dis-

1. Wilson, J. L.: The Use of the Respirator, J. A. M. A. 117: 278 (July 26) 1941.

eases.[2] To this is to be added the normal or inflammatory nasal, pharyngeal and perhaps bronchial secretion. If that cannot be swallowed or completely expectorated, coughed out or aspirated, it will find its gravity level, where it may lie as a pool over and in the airway. That condition was seen with a laryngoscope in case 1. On attempted inspiration, such fluid not only impedes the passage of air but, if at all viscous, it may be drawn into the pulmonary area. In several such cases I have observed the respiration become shallow, spasmodic and irregular and have seen this effect rapidly disappear on thorough aspiration or after tracheotomy, as it did in case 2. This effect on respiration might be due to a voluntary effort of the patient to keep from drowning himself in his own secretions; but since it has been observed in unconscious patients, the result is probably, in part, a reflex effect.

To this factor must be added that of anoxia, which in the 3 cases cited was severe enough to cause unconsciousness. This anoxia necessarily would adversely affect the heart and respiratory muscles and respiratory centers, as well as the nuclei of the nerves concerned in deglutition. Therefore, if there is already an involved respiratory center, or paralysis lower, involving the motor neurons of the intercostal muscles and diaphragm, the accumulating secretion may add an insuperable burden to an already faltering mechanism.

If relief cannot then be given by postural drainage, including the effective face down position, and by aspiration, the short-circuiting of this secretion and the aspiration of its overflow by tracheotomy would seem to be indicated. Also since mortality from this operation per se, separated from the serious conditions for which it is usually done, is a fraction of 1 per cent,[3] there would seem little reason to withhold it for the last desperate chance. Management of a tracheotomized patient in the respirator presented no great difficulties. A special device to keep the rubber collar off the mouth of the tube could easily be constructed attached to an adjustable lock on the neck flange. For such cases the tracheotomy should probably be through the second and third cartilages. In order to prevent interstitial emphysema the least amount of dissection of fascial planes should be done, packing should be snug and the negative pressure of the respirator not greatly raised.

Rest in poliomyelitis has been emphasized as a very important factor in the recovery of compromised muscle function. Again, tracheotomy of an exhausted patient, with or without the respirator, is a measure that may prove of increasing value to be used, as Wilson says of the respirator, not as a last resort but to forestall the critical stage.

The use of the respirator has not often been satisfactory in the bulbar type, according to Wilson. It is possible that this has been so because forced inspiration through a pool of secretion in the airway sucked a serious amount of fluid into the lower airway. In case 1, in which the pool of secretion, which even overflowed the nostrils, was short-circuited by tracheotomy, the respirator was eminently satisfactory although the disease seemed almost entirely bulbar.

It may be questioned whether certain effects commonly ascribed to central damage may not rise from preventable anoxia and peripheral respiratory disturbance. Restlessness, mental symptoms and unconsciousness, which were relieved by aspiration and tracheotomy, certainly seemed to be so in some of these cases. Even the postmortem findings of cerebral edema and hemorrhage not associated with cell infiltration, as well as myocardial degeneration, might arise from relative anoxia continued over a period of time. Pulmonary complications, commonly called pneumonia, have been held responsible for many deaths. Possibly many of these may have been secondary to atelectasis and pneumonitis associated with aspiration, obstruction and immobile lung, as demonstrated in experimental animals and seen in tracheobronchitis.[4]

During the 1943 summer and fall epidemic, 39 cases of poliomyelitis have been treated at the Evanston Hospital. Eight of these were of the so-called bulbar type. There was only one death, cited in case 3, compared to a mortality in this area for the same epidemic of about 8.7 per cent.[5] Although the supervision and nursing care were unusual, the good results, though not statistically convincing, suggest that laryngeal care as outlined in some of the worst cases was quite important.

SUMMARY AND CONCLUSIONS

Emphasis in poliomyelitis with respiratory difficulty may well be shifted to the peripheral respiratory tract. Postural drainage, aspiration and use of the respirator should be given a fair trial. If these are not successful, tracheotomy may be employed as a life saving measure; it may prove to have increasingly wide use before the critical stage. It is easily possible to use a respirator on a patient after tracheotomy. If the airway is cleared of secretion, probably most poliomyelitis patients with respiratory difficulty can be so treated.

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3. Jackson, Chevalier: Tracheotomy, Surg. Clin. North America **15**: 117 (Feb.) 1935.
4. Galbraith, E. G., and Steinberg, Bernhard: The Developmental Mechanism of Pulmonary Atelectasis, Ann. Otol., Rhin. & Laryng. **46**: 800 (Sept.) 1937. Galloway, T. C.: Laryngotracheobronchial Obstructions and Their Secondary Effects, Ohio State M. J. **36**: 851 (Aug.) 1940.
5. Reports of Chicago and Cook County health departments, Oct. 15, 1943; 1,147 cases with 100 deaths.

Diabetes.—The beginning of our modern understanding of this disease (diabetes) dates back to the opening year of the American Revolution, when Matthew Dobson, physician to the Liverpool Infirmary, discovered that the urine, which is passed in too great an abundance in this disease, contains sugar. This discovery led the way to attempts to control the disease by limiting the amount of sugar in the diet, a method which was not very successful. And so the matter stood for another hundred years, until in 1889 the experimental attack on diabetes was begun by a Russian physician, Oskar Minkowski, then a young assistant to Professor Naunyn at the University of Strasbourg. Minkowski removed the entire pancreas in a dog and discovered that severe diabetes at once developed which persisted until the animal succumbed a few weeks later. He also found the sugar content of the blood elevated. The next step was made in 1900 by Eugene L. Opie, recently professor of pathology at Cornell Medical School but at that time a young instructor in pathology at Johns Hopkins. Studying the microscopic sections of the pancreas of a little girl who had died of diabetes, Opie saw that the islands of Langerhans were so degenerated that they could not be identified. These islands of cells of a special kind had been first described in 1869 in a doctoral thesis by a young Berliner, Paul Langerhans, who later became a distinguished pathologist. No one suspected their function, however, until Opie noticed that they were damaged in those who had diabetes. His observation led the English physiologist Sir Edward Schafer in 1916 to postulate the theory that these special pancreatic cells produced some form of internal secretion that controlled the metabolism of sugar.—Haagensen, C. D., and Lloyd, Wyndham E. B.: A Hundred Years of Medicine, New York, Sheridan House, Inc., 1943.

NEUROPSYCHIATRIC COMPLICATIONS IN VICTIMS OF BOSTON'S COCOANUT GROVE DISASTER

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Observations on medical and physiologic aspects, neuropsychiatric complications and social service activities in the care of patients during the acute stages and immediately following the Cocoanut Grove fire disaster of Nov. 28, 1942, which killed 491 patrons and injured many more, have been reported recently through several articles.[1]

This report deals with psychiatric observations made during the first weeks and afterward on the survivors of the disaster who had been admitted to the Boston City Hospital during the night of the fire. These patients were followed up until the present time, which is a period of eleven months.

Members of the staff of the Neurological Unit of the Boston City Hospital saw some of these patients during the first week of their hospital stay. Many of the 131 patients were too disabled by their injuries to permit adequate early interview. Systematic neuropsychiatric examination of all patients was requested on the eleventh day by the Burn Assignment of the Surgical Services of the Boston City Hospital. By the end of the third week all the patients who had not left the hospital by that time, numbering 54,[2] had been examined neuropsychiatrically (table 1). Of these, 3 patients died later and 5 patients left Massachusetts and could not be reached for reexamination. Three of these were members of the armed forces overseas. Therefore this report deals mainly with psychiatric observations on 46 patients seen in the acute stage and followed up later. In 6 of these, who had left Boston, a late follow-up report was furnished by another physician or by the patient in a written response to a psychiatric questionnaire. In addition, psychiatric questionnaires were sent to the 41 patients who had left the hospital early, before systematic routine neuropsychiatric examinations were made. Of these, 20 answered. Only 21 of the 131 patients are not subject of report. Almost all of these 21 patients, having been discharged from the hospital within eleven days, had suffered only minor injuries.

TABLE 1.—*Analysis of Material Available for Neuropsychiatric Observation*

		Number of Cases
Total admissions		131
Deaths within the first two weeks		36
Patients having left the hospital within first 3 weeks		41
No report	21	
Reported through questionnaire	20	
Psychiatric interviews		54
With follow-up	46	
Without follow-up	5	
With patients who died later	3	

Table 2 summarizes the psychiatric findings during the acute stages and the outcome. The table reveals that there is no essential difference of reactions or psychiatric end results between female and male patients. The following observations accordingly apply to both sexes.

ANALYSIS OF TABLE 2

Loss of Consciousness.—Of the 46 patients 29 reported loss of consciousness of variable duration. Only one 22 year old woman (patient 50) has a retrograde amnesia long enough to remember nothing of the disaster. Her last recollection is "having a rye with coke." The next thing she remembers is talking to people in the hospital the next day. The remaining 28 all remember the start of the fire and the ensuing panic. They lost consciousness after a few minutes. Table 3 reveals that in 16 of the 29 cases the loss of consciousness, measured by the duration of amnesia, lasted more than one hour. Most of them recovered awareness in the hospital toward morning of the next day. The 11 patients in whom unconsciousness lasted only a few minutes found themselves lying on the floor of the night club, frequently with bodies piled on them, and they remember being pulled out by rescue workers. In these no relapse into unconsciousness occurred, whereas some with long duration of unconsciousness had a brief lucid interval during the ambulance ride. The period of amnesia of the 1 patient who had suffered a cerebral lesion lasted several days.

The cause of the unconsciousness is still not absolutely certain. Carbon monoxide, which was found in the blood of several victims in amounts sufficient to kill, may have been the only cause, or other noxious fumes may have acted together with lack of oxygen and the intense heat created by the conflagration.

Of the 17 patients who did not lose consciousness, 11 were near exits and escaped within the first minutes. The remaining 6 had fallen early in the general stampede and were prevented from getting up again. Some reported that, while lying on the floor, they held a handkerchief before their mouth and nose to avoid inhaling fumes. Others reported that, whereas they had felt choked while standing up, they felt fresh, cool air and relief as soon as they had fallen. This suggests that the noxious agent, fumes, heat or lack of oxygen acted predominantly above floor level. The fact that most of the 29 who had lost consciousness remember going limp while standing up and, frequently, while trying to rescue others supports this explanation.

Recollection of Events.—The outburst of flames at the start of the fire was observed by 41 of the 46 (table 2). Table 4 gives a picture of the sequence of events. Most patients reported having lost consciousness immediately after feeling choked. Accordingly, this terrifying event is remembered by the same percentage of patients who had lost consciousness as by those who remained conscious. Many fewer patients remembered being burned and trampled on since the latter events evidently occurred mainly while the patients had already lost consciousness.

Psychiatric Outcome.—Of the 46 patients, 20 did not develop any psychiatric complications whereas 26 did. Tables 4 and 5 reveal the striking fact that of the 20 without psychiatric sequelae only 5 had not lost consciousness. Furthermore, table 3 reveals that the dura-

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1. Symposium on the Management of the Cocoanut Grove Burns at the Massachusetts General Hospital, Ann. Surg. **117**: 801-965 (June) 1943. Clowes, G. H. A., Jr.; Lund, C. C., and Levenson, S. M.: The Surface Treatment of Burns, ibid., to be published. Taylor, F. H. L.; Davidson, C. S., and Levenson, S. M.: Abnormal Nitrogen Metabolism in Patients with Thermal Burns, New England J. Med., to be published. Cannon, I. M.; Wilson, M. R., and Bartlett, H. M.: Participation of Medical Social Workers in Boston's Cocoanut Grove Disaster, Bulletin of the American Association of Medical Social Workers **16**: 1-8 (Feb.) 1943.

2. Some of the initial examinations were made by Dr. H. Houston Merritt and Dr. R. D. Adams, who supplied early data.

tion of unconsciousness was prolonged more than one hour in 12 of the 15 patients who did not develop psychiatric complications, whereas the reverse is true of the 13 patients with psychiatric complications. In the majority of the latter, in 9 out of 13, the period of unconsciousness was only a few minutes. This suggests that unconsciousness and in particular prolonged unconsciousness was an essential factor in preventing the development of further psychiatric difficulties. The mechanism at work is perhaps comparable to the beneficial effect of shock treatment in mental disease. Here too attacks of petit mal with short periods of unconsciousness are undesirable, whereas grand mal seizures with prolonged unconsciousness may bring about the setting for recovery from mental illness.

Among the patients with psychiatric complications, recollections of being choked and trampled on are very frequent when compared with the numbers obtained in patients with no psychiatric complications (table 5). These events, which usually were associated with fear of imminent death, were the most terrifying in the patient's memory and seem to have greatly contributed to the development of post-traumatic mental complications.

The types of psychiatric complications were consistent either with the syndrome of "general nervousness" or with that of anxiety neurosis. Patients in the former group complained chiefly of general irritability, fatigue

TABLE 2.—*Comparison Between Reactions of Female and Male Patients*

	Females	Males	Totals
Totals	26	20	46
No loss of consciousness	9	8	17
Loss of consciousness	17	12	29
Remembers			
Seeing flames	23	18	41
Being burned	8	6	14
Being choked	11	7	18
Being trampled	10	4	14
Nightmares			
While in hospital	9	6	15
After discharge from hospital	4	6	10
Loss of relatives or close friends	15	8	23
Neuropsychiatric outcome after 3 months:			
Normal	11	9	20
Psychiatric complications, total	14	11	25
General nervousness	6	5	11
Anxiety neuroses	8	6	14
Brain lesion	1	0	1
Neuropsychiatric outcome after 9 months:			
Normal	17	15	32
Psychiatric complications, total	8	5	13
General nervousness	2	2	4
Anxiety neuroses	6	3	9
Brain lesion	1	0	1

TABLE 3.—*Duration of Unconsciousness in Patients With and Without Post-Traumatic Psychiatric Complications*

Duration of Unconsciousness	No Psychiatric Complications	Psychiatric Complications	Brain Lesion	Totals
Few minutes	2	9	0	11
15 minutes to 1 hour	1	1	0	2
More than 1 hour	12	3	1	16

and insomnia. In these cases change in working capacity was only moderate or absent unless work was contraindicated by their poor physical condition, as by unhealed burns. Table 2 reveals the comparatively good prognosis of this condition, as on the nine months follow-up only 4 of the 11 patients, or one third, still complained of general nervousness. The histories and the course of disease in patients of this group are fundamentally identical and the following example is representative:

CASE 51.—A musical entertainer at the Cocoanut Grove, aged 17 years, single, had been an exceedingly well adjusted girl prior to her injury. On the night of the disaster she was in the

TABLE 4.—*Comparison Between Reactions of Patients With and Without Loss of Consciousness*

	No Loss of Consciousness	Loss of Consciousness
Totals	17	29
Remembers		
Seeing flames	17	24
Being burned	9	5
Being choked	7	11
Being trampled	8	6
Nightmares		
While in hospital	7	8
After discharge from hospital	7	3
Loss of relatives or close friends	6	17
Neuropsychiatric outcome after 3 months:		
Normal	5	15
Psychiatric complications, total	12	13
General nervousness	4	7
Anxiety neuroses	8	6
Brain lesion	0	1
Neuropsychiatric outcome after 9 months:		
Normal	11	21
Psychiatric complications, total	6	7
General nervousness	2	2
Anxiety neuroses	4	5
Brain lesion	0	1

TABLE 5.—*Comparison Between Data for Patients With and Without Psychiatric Complications Three Months After Injury*

	No Psychiatric Complications	Psychiatric Complications	Brain Lesion
Totals	20	25	1
No loss of consciousness	5	12	0
Loss of consciousness	15	13	1
Remembers			
Seeing flames	17	24	0
Being burned	7	7	0
Being choked	4	14	0
Being trampled	3	11	0
Nightmares			
While in hospital	5	10	0
After discharge from hospital	0	10	0
Loss of relatives or close friends	10	12	1

ladies' room when she heard people rushing around. She saw fire shoot up the stairs and, while trying to get out, felt choked. She fell and people stepped on her. She then lost consciousness for a few minutes and regained awareness when a fireman pulled her out. She had suffered burns of the face, arms, back and legs with 30 per cent of the surface area burned and with the burns equally divided between second and third degree. She stayed in the hospital until May 1, 1943. During the first months she slept poorly and had several terrifying dreams about fire. She did not want to be left alone and felt that she would always live in fear of fires. After coming home she first disliked the idea of going to crowded places but later on did not mind it. She still chooses to sit near an exit. (This reaction is shown by practically all patients regardless of whether they developed psychiatric complications or not.) She felt tired for many months, and loud noises irritated her. When she heard fire sirens she kept wondering whether her relatives were safe. Nevertheless she resumed her practice of singing and playing as soon as she went home, and her interest in her profession has never abated. On the nine months follow-up she had recovered from her nervousness. She had not had any frightening dreams after coming home and felt happy to be alive. Her relatives think that her personality has not changed.

Patients with symptoms of "anxiety neurosis" complained mainly of fears and anxiety which they were unable to control and which prevented them from read-

justing to normal activities. Their prognoses were not good, as 9 of the 14, or two thirds, had hardly improved when reexamined after nine months. The complaints of the patients in this group are also much alike and are represented by the following case:

CASE 2.—A youth of 20, a clerk, had been somewhat excitable and easily angered prior to his injury but aside from that had been well adjusted to his professional and married life. On the night of the disaster he was about to leave the night club and stood near an exit waiting for his wife, who was four months pregnant. He suddenly saw flames, was milled around, lost sight of his wife and soon escaped through an exit. The patient suffered second degree burns of the face, neck and hands. Five per cent of the total skin area was involved. Shortly before leaving the hospital on Dec 15, 1942 he was told by the priest that his wife had perished in the fire. Until then he had thought she had been saved. He became deeply depressed and has been so ever since. He went back to work in January 1943, but his working capacity has suffered. He is much slower and has lost all interest in his work. In his spare time he thinks of the disaster and of his wife, feels that he will never be interested in another girl. He cannot concentrate and starts shaking all over whenever he has a slight argument. He is constantly afraid of another fire and would never dare to go to a night club again. He sits down in moving pictures only if there is a seat in the last row, so that he can get out quickly. He takes the same precautions in dining rooms. The sound of fire engines awakens him at night with a start. He had had no nightmares in the hospital, but they began one week after he came home. In the following months he relived the scenes of the fire in five terrifying dreams. They still occur, though rarely. He had the last nightmare in September 1943. The patient was rejected by the Army in March 1943 with the diagnosis of psychoneurosis. This depresses him deeply because he had hoped to be able to forget through strenuous army life. He is trying again to join the Army and intends to join the Merchant Marine if again rejected.

In this as in some other cases, feelings of guilt for not having saved the companion evidently aggravate the condition. Practically all patients who are suffering from psychiatric complications are under the care of their own physicians and are treated by them with sedatives and reassurance.

CASE 12.—A woman aged 22 suffered a permanent brain lesion. Her pulmonary damage was only slight and her superficial burns were not over 3 inches in diameter and were healed in a few days. This case is reported in extenso elsewhere.[3] She arrived at the hospital in a state of confusion and psychomotor excitement, which lasted several days. She has ever since exhibited the picture of visual agnosia as it is produced by occipital lobe lesions. Her condition has improved, since, through compensatory mechanisms, she is now able to recognize objects, but her reading and copying are still much impaired. Exposure to carbon monoxide is possibly the cause of the brain lesion.

Only 1 other patient is known to have suffered a permanent brain lesion. This is 1 of the 39 patients admitted at the Massachusetts General Hospital following the disaster.[4] It is probable that cerebral injury was present in other patients who succumbed.

An example of 1 of the patients who did not develop psychiatric complications is given in detail.

CASE 50.—A woman aged 22, a factory worker, had finished the second year of high school and has ever since worked steadily without having ever noticed symptoms of mental difficulties. All she remembers of the events preceding the fire is sitting at a table and having "a rye with coke." Next thing she remembers is talking to people at the hospital early the next morning. Her girl friend, who did not lose consciousness until later, stated that they were at the ladies' room when the fire started. They both rushed out and were separated by the crowd.' The patient suffered second degree burns of the face and hands. Two per cent of the total skin area was involved. She was hoarse for three weeks. On psychiatric interview, two weeks after the injury, she stated that it did not bother her in the least to think of the night of the fire and that she was looking forward to going to another night club. She returned to work in January 1943 completely recovered. A few days later she enjoyed her next night club visit thoroughly. However, when she got into an overcrowded night club a few months later she did not want to stay and she persuaded her party to go to another night club. Although it does not actually trouble her to speak about the fire, she rather changes the subject on such occasions. She states that it was quite a shock for her to hear that a man and a woman from her party had perished, but she does not suffer when thinking of it. At no time had she any frightening dreams. Neither she nor her friends have noticed any personality change except for her being even somewhat more active in her social life than previously.

Nightmares (tables 2 and 5).—One third of the patients had nightmares while in the hospital, in which they relived scenes of the disaster in a more or less realistic manner. They usually woke up frightened, trembling and perspiring. Terrifying events, such as this conflagration was, frequently cause nightmares, since the victims are startled and for some time unable to deal with the event on a conscious level. Thus, such dreams were reported by patients who later developed mental disturbances as well as by those who exhibited no other psychiatric symptoms. Table 5 shows that nightmares are more likely to be had by patients with later mental complications. In particular, recurring nightmares or nightmares beginning some weeks or even months after the event are of different significance. They were not experienced after discharge from the hospital by any of the patients who had remained free of mental difficulties. But frightening dreams persisted in 10 of the 25 patients with psychiatric complications, thus indicating their continued anxiety. None of the patients with general nervousness had these late nightmares, but they persisted in 10 of the 14 patients with anxiety neuroses.

TABLE 6.—*Comparison Between Patients With and Without Neuropsychiatric Complications and Their Degree of Burns and Respiratory Damage*

	No Psychiatric Complications	Psychiatric Complications	Brain Lesion
Totals	20	25	1
More than 10% surface burns	4	5	0
More than 5% surface third degree burns	3	3	0
Severe respiratory damage	9	7	0

Effect of Bereavement on Psychiatric Outcome.—One half of the patients had lost relatives or close friends in the disaster (table 2). Table 5 reveals an equal distribution of patients who had suffered bereavement and of those who had suffered no personal loss among those with and without psychiatric complications. This should not occasion surprise when one realizes from frequent experiences that grief reactions, severe as they may be temporarily, only rarely cause lasting psychiatric disturbance. While the patients were still in the hospital, the question of which would be the best time and which the best way to tell them of their loss came up frequently. It seems that no general rules can be laid down but that common sense has

3. Adler, Alexandra: Disintegration and Restoration of Optic Recognition in Visual Agnosia, Arch. Neurol. & Psychiat., to be published.
4. Cobb, Stanley, and Lindemann, Erich: Neuropsychiatric Observations, Ann. Surg. 117: 814-824 (June) 1943.

to decide this problem. For instance, it is generally known that uncertainty may be more disturbing to a patient than final knowledge of the loss. Therefore, anxious questions should be answered truthfully and sympathetically.

On the other hand, one would refrain from adding another burden such as a death notice to a patient at a time when his physical condition is precarious.

Table 6 allows a comparison of numbers of patients with and without psychiatric complications in relation to the severity of burns and respiratory involvement.[5] It shows that there is an about equal distribution of severely affected patients among the two groups. Actually there are relatively fewer patients severely burned and with severe respiratory damage in the group with psychiatric complications than among the patients with no post-traumatic changes. However, the difference is too small to allow any conclusions other than that the occurrence of psychiatric complications did not bear any direct relationship to the severity of burns or respiratory damage.

Twenty patients with whom personal interviews were not obtainable are not included in the statistical analysis of psychiatric observations. In answer to a psychiatric questionnaire (table 1) 9 reported mental difficulties which consisted of nervousness, insomnia, fears and anxiety, whereas 11 of them stated that they had not noticed any psychiatric changes after the disaster.

SUMMARY

Of the 131 patients brought to the Boston City Hospital during the night of Boston's Cocoanut Grove fire, neuropsychiatric examinations in the hospital and later interviews were carried out on 46 patients. Of the remaining 85 patients, 39 died. Twenty answered through written questionnaires, whereas of 26 patients no follow-up was obtainable.

Of the 46 patients 20 did not manifest psychiatric complications at any time afterward, whereas 25 presented symptoms of general nervousness and anxiety neuroses lasting at least three months. Nine months after the disaster 32 of the 46 patients did not show any aberration from their pretraumatic personality, whereas 13 still suffered from general nervousness and anxiety neuroses. One patient has a lasting brain lesion with the symptoms of visual agnosia. This lesion of the occipital lobe was probably caused by exposure to carbon monoxide fumes but may also have been caused by other noxious gases or lack of sufficient oxygen supply.

Twenty-nine of the patients had become unconscious during the fire as against 17 who did not lose consciousness. The loss of consciousness was less than one hour in 13 instances and lasted from one to several hours or days in the remaining 16.

Of the 20 patients who did not develop psychiatric complications 15 had lost consciousness, which with 12 of the 15 was prolonged beyond one hour. Of the 25 patients with psychiatric complications 13 had lost consciousness. This, however, was short, below one hour, in 10 of the 13 cases. Therefore unconsciousness, and in particular prolonged unconsciousness, prevailed in patients who had stayed free of psychiatric complications, whereas there was no loss of consciousness or it was of very short duration in most of the patients with post-traumatic mental complications.

The percentage of patients who had lost relatives or close friends in the disaster was the same among those who developed psychiatric complications as it was in patients whose personality did not manifest post-traumatic changes. Severe and light degrees of burns and of respiratory involvement were distributed in about equal percentages among patients with and without psychiatric complications.

5. The degrees of burns and of respiratory involvement are evaluated according to a table prepared by Dr. Maxwell Finland and others.

DISTRIBUTION OF EPIDEMIC KERATOCONJUNCTIVITIS IN THE UNITED STATES

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Keratoconjunctivitis is not a new disease. It was described by Stellwag von Carion [1] and by Fuchs [2] in 1889, and since that time severe and extensive outbreaks have been reported by Wright,[3] Herbert,[4] Kirkpatrick [5] and Kirwan [6] from India, Viswalingam [7] from Malaya and Mulock Houwer [8] from Java. Epidemics have occurred in China, Japan, Tasmania, Germany, the Balkans and England. No race is exempt, and no particular occupation is either predisposing or responsible for it.

The attention of the medical men of the United States was called to the potential economic loss of man power hours by Rieke,[9] Holmes,[10] Hogan and Crawford [11] and others.

The particular phase of the subject to which this communication is addressed is the distribution of epidemic keratoconjunctivitis in the United States.

An inspection of the accompanying map will show that in the continental United States there have been only four large outbreaks; in Portland, Ore., Rieke saw several hundred; in Seattle Dawson reported hundreds of cases; in the San Francisco Bay area several thousand patients were treated by Nutting, Cordes, Hogan and Crawford and others, and in Schenectady, in the capital district of Albany, N. Y., thousands of patients were afflicted.

L. C. Hobson [12] saw 16 patients all living in a Veterans Administration hospital in southern California, an isolated nonoccupational group. His paper was important not only because it was early but also because it established the basic fact that his patients were not industrial workers.

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2. Fuchs, E.: Keratitis punctata superficialis, Wien. Klin. Wchnschr. **2**: 837-841, 1889.
3. Wright, R. E.: Superficial Punctate Keratitis, XIII Concilium Ophthalmologicum Hollandia **1**: 338, 1929; Superficial Punctate Keratitis, Brit. J. Ophth. **14**: 257-291 and 595, 1930.
4. Herbert, H.: Superficial Punctate Keratitis Associated with an Encapsulated Bacillus, Ophth. Rev. **20**: 339-345, 1901.
5. Kirpatrick, H.: An Epidemic of Macular Keratitis, Brit. J. Ophth. **4**: 16-20, 1920.
6. Kirwan, E. O'G.: Epidemic Superficial Punctate Keratitis in Bengal, Proc. All-India Ophth. Soc. **3**: 1, 1933.
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8. Mulock Houwer, A. W.: Keratitis nummularis (Dimmer), Nederl. tijdschr. v. geneesk. **82**: 4152-4156 (Aug. 27) 1938.
9. Rieke, F. E.: Epidemic Conjunctivitis of Presumed Virus Causation, J. A. M. A. **119**: 942 (July 18) 1942.
10. Holmes, W. J.: Epidemic Infectious Conjunctivitis, Hawaii M. J. **1**: 11-12 (Nov.) 1941.
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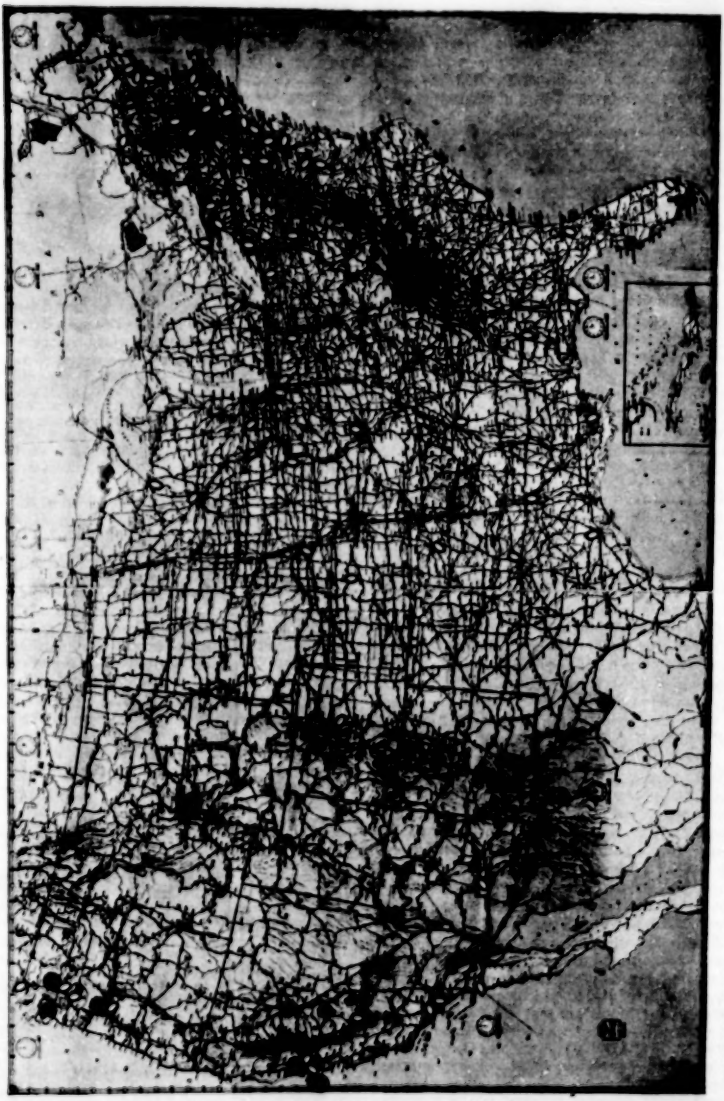
12. Hobson, L. C.: Acute Epidemic Superficial Punctate Keratitis, Am. J. Ophth. **21**: 1153-1155 (Oct.) 1938.



Epidemic keratoconjunctivitis in the United States during the years 1941 and 1942. The black serrate circles indicate major outbreaks, the white ovals cities from which reports to the author were received.

W. J. Holmes in 1940 reported an epidemic in the Hawaiian Islands. Shortly thereafter Rieke began to see afflicted shipyard workers and within six weeks treated 500 men. Significant phrases in his summary bear repetition: "involved a small percentage of the exposed men," "spread rapidly over the United States." In words made famous by the eminent statesman ex-Governor Alfred E. Smith of New York, "let us look at the record" compiled from letters received from observers of wide clinical experience and from published articles.

R. A. Fenton of Portland, Ore., writes:

Because this originated on this coast among shipyard workers here and on Puget Sound, it was accepted as an industrial disease by the Oregon Industrial Accident Commission and the Washington Bureau of Labor and Industries. I suspect that more than 2,000 cases have been seen in and around Portland, and we have seen a good many cases coming from other parts of the state. Many individuals who have had no contact with industrial hazards, such as welding, and are not acquainted with shipyard workers have had this disease. We are not seeing as many corneal involvements as we saw a year ago.

Reporting from Seattle, Purman Dorman includes among other statements:

The condition first started in the vicinity of Seattle about December 1941 or January 1942. In the beginning I was fortunate to see almost every bad case that occurred within the Seattle-Tacoma Ship Yard. The infection spread rapidly, the number of new cases rose from none in November 1941 to about 200 a month in January, February and March 1942. Since that time the company has given all medical care in such cases within their own yards. The number of 200 is only an estimate, but the number "peaked" within an interval of three to six months.

Most of the cases seen now are far less severe, with greatly shortened convalescence. From what I have been able to determine, with the added experience of some of my colleagues, apparently there are no permanent opacities within the stroma or on the epithelium, although the spots sometimes remain three to nine months.

F. J. Pinkerton of Honolulu told me that he had seen more than 450 cases, so that the Hawaiian Islands seem to have been a large focus of infection, but here again note that the majority were neither confined to industrial workers nor found in any one occupation. Pinkerton said he did not believe the disease could be classified by any qualified judge as coming under the provisions of workmen's compensation laws.

It is to be noted that there is a distinct clash of opinions between Pinkerton, who maintains that keratoconjunctivitis is not an industrial hazard, and two state commissions which claim that it is compensable. The former opinion is based on study; the latter suggests hasty conclusions or perhaps a political expedient. It is hoped that subsequent decisions will be based on facts, not prejudices or fancies. I hold with Pinkerton and others that it is not an occupational disease.

Several hundred miles from Seattle the extremely important and active San Francisco Bay area, including San Francisco, Oakland and surrounding cities and towns, was seriously affected. The epidemic has been scientifically described by Hogan and Crawford in their comprehensive article in which they demonstrate their clinical acumen in vivid portrayal of the signs and accurate description of the symptoms. Their communication is the best which has appeared, and although they may have included some cases which seem to be of greater severity than those seen elsewhere, their observations are comprehensive and their deductions sound. Special attention is drawn to their severest cases of membranous conjunctivitis and uveitis, for these cases were not duplicated in the eastern experience. For factual and bibliographic data the reader is urged to study their original thesis.

Two letters add to the interest in this geographic location, one from F. C. Cordes of San Francisco, who writes:

In general the number of cases seen in the region of San Francisco is markedly reduced from the number seen in the original epidemic a year and a half ago. There have probably been some 250 to 300 cases during the past six months. The incidence of corneal complications is small by comparison with the original epidemic, consisting of a few punctate infiltrates in the superficial layers of the stroma of the cornea and in some instances in the epithelium.

The incidence of enlarged preauricular glands was much reduced, and only occasionally was a membranous formation seen on the conjunctiva. So, all in all, the disease was much less severe, ran a shorter course and was accompanied by fewer complications.

The other from R. J. Nutting across the bay in Oakland, Calif., is a notable addition to the history of the California outbreak:

We first saw this condition of acute keratoconjunctivitis in the latter part of September 1941. The first patient was seen at the University of California, and in October we were seeing anywhere from 2 or 3 up to 10 patients a day.

Our first patients showed photophobia, lacrimation, different degrees of swelling of the lids, redness and thickening of the palpebral conjunctiva, and about half of the patients seen at that time had the corneal involvement commonly known as superficial punctate keratitis. In the majority of the later patients the punctate areas were mostly confined to the pupillary area, which naturally resulted in a definite loss of visual efficiency. About half of them had involvement of the preauricular glands. Other characteristic symptoms were a feeling of general malaise, slight sore throat and other symptoms of a moderate head cold. Usually there was an involvement of one eye at first and a few days later the other.

This epidemic was spread over a good cross section of the population in its first and most severe phase, which lasted from late September to the middle of November. Then there were only occasional new cases until the middle of December, when the recrudescence of the epidemic seemed to involve industrial groups such as the shipyard workers. This phase of the epidemic continuing through to the present has not been so severe as the first phase and is not so prone to result in visual impairment. The average course of the first phase was two to four weeks for the actual inflammation, of the second phase one to two weeks.

In our private practice I can conservatively say we have seen at least 500 or more patients with this disease, and at one time in the Richmond shipyards there were over 1,000 cases. The disease spread rapidly until there were at least 5,000 cases in the Bay Area.

At the present writing we are still seeing a few mild cases.

The corneal lesions cleared anywhere from a few weeks to one year. We had no complications, such as involvement of the interior of the eye or true ulceration of the cornea, and no permanent disability. Other men have reported complications but from our experience we consider these secondary to some other factor.

We saw the first patients in this area, and diagnosed their disease as conjunctivitis with superficial punctate keratitis.

On account of our location on the coast, I personally feel our first patients were carriers from Hawaii and the Far East, as our first patient at the University of California lived at the International House. Age was no factor, as we had one patient 3 weeks old with this disease and another in the 80's. In our experience this disease was most prevalent in the white race.

A. Ray Irvine of Los Angeles investigated his district. He writes:

During the last six months the epidemic of keratoconjunctivitis that we had here previous to that time has practically disappeared. I have seen not more than a half dozen cases, only 2 of which have shown any corneal involvement in the form of a superficial punctate keratitis. These cases were mild compared with some that we saw last year.

Inquiry among men who do industrial work assures me that the cases are comparatively rare now.

While from nearby Pasadena, W. H. Roberts writes:

This city, as you know, is largely a residential city with few factories and industries. Twenty-two cases have been reported by the ophthalmologists of the city. We see the usual run of cases of keratoconjunctivitis, but I personally have seen none of the epidemic type.

J. R. Walker at Fresno said there were very few cases in his vicinity.

C. A. Veasey of Spokane, Wash., some hundreds of miles inland from Seattle and Portland, Ore., reports only about 25 patients with the disease, some of whom migrated from the Pacific Coast.

Still farther inland, E. M. Neher of Salt Lake City reports very few cases.

From Denver M. E. Marcove writes:

I have contacted many of the Denver men with regard to their experience in acute keratoconjunctivitis and have found only one man besides myself who has seen any cases. Dr. D. H. O'Rourke says he has seen about 25 cases in the past six months. I have seen 12. The incidence has not assumed epidemic proportions in our city.

J. H. Judd of Omaha writes:

Some of the local men have not yet reported as to their records of acute keratoconjunctivitis. We have not had more than 35 or 40 cases in this locality, and most of these were mild. Only a few showed any serious corneal involvement, and in only 3 was there any involvement of preauricular and cervical lymph glands.

Fifteen of my cases occurred in one department of a creamery company with an incidence of 1 new case a day until the company was forced to shut down for about four days because of an explosion of the refrigerating system. Since that time 20 new cases have developed. Our cases are apparently all self limited.

A. C. Hilding of Duluth, Minn., writes:

We have not had anything out of the ordinary in this community.

F. E. Burch of St. Paul reports practically no cases.

S. R. Gifford of Chicago summarizes his experience:

I have been seeing for the past five years a group of cases which I have considered as belonging in the class described as epidemic keratoconjunctivitis. There have been about 30 of these in my office practice and I cannot tell you exactly how many we have seen at the clinic, since the cases there are seen by different men and are probably not diagnosed in the same way. These cases differ somewhat from the present very acute form of the disease and within recent months I have seen only 2 of these acute cases which seem to answer the description of Hogan and Crawford.

My own opinion is that they are all cases of the same disease, but when the condition assumes the epidemic form the virus increases in virulence and produces a somewhat different picture.

E. L. Bulson of Fort Wayne, Ind., and C. W. Rutherford of Indianapolis found few in their districts. Masters at a later time could collect only a few that were typical, so that Indianapolis seems to have been spared.

L. T. Post and W. H. Luedde interrogated their colleagues in St. Louis and determined that only 14 cases had been seen in that metropolis.

Swinging back to the dry clear air of Phoenix, Ariz., we hear from D. F. Harbridge, who writes a long and interesting account of his experience with several cases but by no means an epidemic.

E. H. Cary of Dallas reports for Texas a few isolated cases.

F. A. Davis in Madison, Wis., has not observed any increase in the number of cases of keratoiritis.

C. L. LaRue of Shreveport, La., found only a limited number, as did C. A. Thigpen of Montgomery, Ala.

And from New Orleans C. A. Bahn reports that very few cases have been seen or recorded by the physicians of his community. A similar report was received from W. A. Cook of Tulsa, Okla.

E. N. Robertson of Concordia, Kan., P. J. Leinfelder of Iowa City, H. C. Ellett of Memphis, Tenn., M. McT. Cullom of Nashville, Tenn., N. M. Black of Miami, Fla., S. A. Richardson of Jacksonville, Fla., M. F. McCaslin of Pittsburgh, Carsen of Scranton, Pa., and W. T. Davis in Washington, D. C., found no evidence of an epidemic.

Clapp reports:

I desire to say that we have seen between 30 and 40 cases during the past six months. These cases have never been in the form of an epidemic nor have they been like those cases reported by Rieke on the West Coast. In fact, while the cases have been more numerous, they have not been in any particular way different from former cases of keratoconjunctivitis with the possible exception that the lesions have been seemingly more resistant to treatment.

I have also inquired at the free clinics of my colleagues and they have seen far fewer than we have.

W. O. LaMotte of Wilmington, Del., and E. S. Sherman of Newark, N. J., noted only isolated, rare cases.

From the Philadelphia and Camden area, which includes immense manufacturing plants of various kinds and large shipbuilding yards, Burton Chance reports:

Numerous cases have been seen in this community without, however, its being a widespread epidemic. One group at the Wills Hospital consisted of 30 odd patients; another group, of only 8 or 10, not sufficient for great stress to be laid on them. Along with swelling and redness there has been but scant discharge, in which no specific, hitherto unnamed organism was found. Not all patients had swelling and tenderness of the preauricular glands. One of the surgeons was affected but he has entirely recovered.

and J. S. Shipman of Camden, N. J., writes:

Regarding the cases of keratoconjunctivitis seen by the men in Philadelphia during the past six months, I can say that we have seen far too many but not, I think, in the proportions which I understand you have up in your section. At the Wills Hospital we had about 20 or 30 cases develop in the wards, and so far as I know only 2 of the patients had corneal involvement.

One of my associates in the clinic found the same condition in his right eye but without any definite corneal involvement.

Dr. J. M. Wotring of Reading, Pa., reports about 50 cases in that city, while Dr. G. W. Schlindwein of Erie, Pa., had none.

The New England states have been remarkably free. T. L. Terry of Boston has carefully checked Massachusetts and summarizes the results as follows:

To date 66 possible cases of epidemic keratoconjunctivitis have been reported by private physicians. Tabulation on the

basis of employment showed 26 nonindustrial (housewives and children) and 40 industrial (miscellaneous industrial 30, shipyards 10). The more suspicious cases were followed up, but in no case did the observer record the classic clinical symptoms, a duration of over two weeks or any epidemic characteristics.

One physician in Brockton described a case with the classic symptoms, duration and sequelae. This condition occurred in a housewife who had no history of contact. Neutralization tests were made.

The diagnosis was made in 2 other cases by two separate physicians, but the patients did not return for follow-up, the implication being that they improved rapidly, tending to negate the diagnosis.

Four cases were reported at each of two plants. Investigation proved, however, that the conjunctival disease in one case was due to the use of a solvent and in the other to local irritation.

E. N. DeWitt of Bridgeport, Conn., said that he and his colleagues had seen quite a few; E. M. Blake of New Haven, Conn., very few, and this was the experience of W. F. Holzer in Worcester, Mass.

Parker Heath of Detroit, when he spoke at the meeting of the Michigan State Medical Society, reported 50 known cases and said that probably many had not been recorded.

H. W. Cowper of Buffalo estimates that there were 200 to 300 cases in that district.

On the other hand, in industrial Rochester, N. Y., A. C. Snell could uncover only a single record.

G. G. Marshall of Rutland, Vt., found no cases in his state.

H. F. Hill of Waterville, Me., S. J. Beach of Portland, Maine, and W. E. Kershner of Bath, Maine, the site of the extensive shipyards, all report only a few cases.

J. A. MacMillan of Montreal writes:

> I got in contact with the French oculists and those who are doing the Army work and our own group and none of the men have noticed any difference whatsoever in the ordinary run of conjunctival and corneal lesions.

And from the Pacific Coast, C. E. Davies of Vancouver, B. C., reports:

> We have been relatively free of this condition, and as far as I am aware there is no evidence in lower British Columbia of anything that might be interpreted as of an epidemic nature.

As one approaches the region of greatest concentration in the East, one stops in Brooklyn, where J. N. Evans observes:

> You will be interested to know that in spite of our great shipping interests in Brooklyn and the fact that the Long Island College Hospital is on the water front, we have, nevertheless, seen practically no cases of keratoconjunctivitis. The same holds true for the Brooklyn Eye and Ear Hospital. We have discussed this peculiar situation at the New York Ophthalmological Society and have thus far not found a satisfactory explanation.
>
> I suppose there must be a few cases but not enough for the men to remark about.

In New York Conrad Berens interviewed the ophthalmologists of the various hospitals to obtain the following reports.

W. G. Frey: No case of epidemic keratoconjunctivitis is in the clinic at St. Luke's Hospital.

W. B. Allen: Lately we have had quite a few cases of what we diagnosed as acute epidemic conjunctivitis, but in my clinic in the Bronx Eye and Ear Infirmary we have had only one.

D. B. Kirby: Two nurses and 4 patients were treated at Bellevue Hospital.

J. M. McLean: We have seen over 20 patients with this disease and treated at least 12 with a 5 per cent aqueous solution of sodium sulfathiazole sesquihydrate. On the whole the patients so treated seemed to have a shorter and less severe course of illness than those whose eyes were irrigated with boric acid and treated with zinc sulfate. However, the series is far too small to enable one to make any definite conclusions. Some of the eyes so treated seemed to clear in as short a time as four days. In no instance did we have as dramatic results as those reported by Braley with specific serum.

F. C. Keil: I might say that they were comparatively few over the period of the last few months. All of the four services at the Manhattan Eye, Ear and Throat Hospital treated not more than 20 persons for this infection.

E. F. Krug in a letter to Berens said he had seen quite a few cases in private practice.

Arnold Knapp approached the subject by interviewing colleagues and found 209 cases, the number collected by Braley. Some of these may be duplicated in the other reports.

Sanders,[12] Braley,[14] Berliner [15] and others have written articles.

And so one comes to the Eastern focus in Schenectady, N. Y., and the adjacent cities. From Troy, N. Y., F. M. Sulzman reports 30 cases.

In Schenectady there are two large plants, the General Electric and the American Locomotive. From what I consider reliable information, about 4 per cent of the population of the community were afflicted with keratoconjunctivitis. The percentage was the same for the employees of the two plants.

The epidemic started in September 1942, spread rapidly and then almost stopped; a second wave of less intensity followed. Now there are only sporadic cases.

The involvement of eyes was on the whole much less severe than the extreme form described by Hogan and Crawford. Deep corneal invasion was rare, and iritis was seen only a few times. In some the conjunctival reaction was intense, in others slight. There was no definite relationship between the severity of reaction and the extent of corneal infiltration. With the exception of the usual apprehension of any patient with the disease, the mental and physical reactions were in the main not noteworthy or different from what is usual with a conjunctival infection. The end results are and will be for a long time under observation. The corneal infiltrates are absorbing.

SUMMARY

A worldwide conjunctival and corneal disease assumed epidemic proportions on the Pacific Coast and later in an inland city. The explanation of its predilection for some coastal cities in the West and its practically complete absence in similar localities in the East is something to engage the attention of the student.

Its failure to appear in any of the great army mobilization centers speaks well for the health of the men in service as well as for the high standard of sanitation in the camps.

13. Sanders, Murray: Epidemic Keratoconjunctivitis, Arch. Ophth. 30: 581 (Oct.) 1943. Sanders, Murray, and Alexander, R. C.: Epidemic Keratoconjunctivitis, J. Exper. Med. 77: 71 (Jan.) 1943. Sanders, Murray; Gulliver, F. D.; Forchheimer, L. L., and Alexander, R. C.: Epidemic Keratoconjunctivitis, J. A. M. A. 123: 250 (Jan. 23) 1943.

14. Braley, A. E., and Kuckens, Murray: Treatment of Epidemic Keratoconjunctivitis, J. A. M. A. 123: 909 (March 27) 1943.

15. Berliner, M. L.: Epidemic Keratoconjunctivitis, Am. J. Ophth. 26: 30 (Jan.) 1943.

CONCLUSIONS

Keratoconjunctivitis is not a new disease. It affects young and old.

There has been no epidemic in the shipyards on the Gulf of Mexico or along the Atlantic Coast, proving conclusively that it is not a shipyard disease per se.

During the rush of war and the overwhelming number of cases it is possible that several diseases have been included under the title epidemic keratoconjunctivitis. It is certain that more complications and greater and more extensive ocular involvements were reported from the West Coast and Hawaii than have been experienced in other parts of the country.

To infer that the epidemic spread throughout the United States is not warranted by the collected facts.

344 State Street.

ABSTRACT OF DISCUSSION

DR. THOMAS D. ALLEN, Chicago: Is this a new disease? Is it infectious? What should be our attitude? We in the Chicago region would agree in part with Dr. Bedell. It is not new in the world, but as it exists in the United States today it is new to us. It is with us in a mildly endemic form, cropping up among most unexpected people—professors, shopmen, laborers, lawyers, stenographers, traveling men, housewives, merchants, businessmen; seldom are two in a family affected simultaneously, although in a given shop several in a group may have the disease at the same time. Any ophthalmologist who has had the disease, as I have, and has traced it to the source, as I did, would agree that it is infectious. Why it is that in some communities there seems to be a lack of immunity and in others there is no trace of the disease is a question epidemiologists are trying to solve. Dr. Sanders has found an exact way of determining the presence of immune bodies in the blood of individuals but it is tedious, time consuming and expensive. In communities where it has suddenly gained access its control has been in direct proportion to the vigilance of the medical profession and the local boards of health. A few cases were seen in Chicago last summer (1942) but the medical profession did not awaken to the serious import of the situation till about Christmas. Then an intensive campaign was mapped out, with the result that we have an active committee. We are attempting to trace the source in each case. We have noted in the Hammond, Ind., region an apparent change in the character of the disorder (Dr. Hedwig Kuhn reports that only about 10 per cent develop keratitis as opposed to about 65 to 80 per cent at first). Soap and water are our first line of defense. Prompt isolation and treatment have saved us from a real epidemic.

DR. MICHAEL J. HOGAN, San Francisco: I have been interested in the distribution of this disease, as it has a bearing on the nature of the causative agent and the method of its transfer. The results of Dr. Bedell's survey lead one to attempt several conclusions. First, that the epidemic on the Pacific Coast must have been initiated by patients who acquired the disease in the Hawaiian epidemic and carried the infectious agent to the mainland. Second, that the disease first gained a foothold in shipworkers and was spread rapidly among them both by close contact and by the considerable shifts in personnel which occurred during 1940-1941. These facts would indicate that the disease, whatever its initial method of spread, was further disseminated by contact infection. From shipbuilding plants the routes by which this condition might reach nonindustrial areas would not be too difficult to trace. We have no knowledge concerning the methods of transmission of this disease from area to area, whether it is by insect or other vector, carriers or missed cases. Therefore it is more difficult to explain outbreaks in other portions of the country, such as Schenectady, while intervening areas are unaffected. I know of a number of patients with the disease who left this area to visit Chicago and New York and were certainly capable of spreading the disease. Yet the comparative incidence of the disease in these cities was low. I concur that the disease is not directly the result of lowered resistance from corneal foreign bodies, arc flashes and a smoky atmosphere. However, one finds it hard to explain the high incidence of the disease in industrial plants, while the incidence in the general population is relatively low. The California State Industrial Accident Commission has ruled that the disability resulting from the disease is compensable in this epidemic because the incidence of the disease was higher among shipworkers than in the rest of the population. The California State Supreme Court has concurred with this finding. Many of us have disagreed with this opinion, but employers have been ordered to recompense their employees.

DR. A. J. BEDELL, Albany, N. Y.: Dr. Allen's comments on the widespread distribution of the disease, how it attacks many people of various social conditions who are in no way associated with shops, his belief that the character of the disorder has changed, and his statement that there is less corneal involvement have added to our knowledge of the condition. His last expression causes us to wonder if some common diseases are not being included under the heading of epidemic keratoconjunctivitis. There can be no justification for using the term unless the cornea is involved. I approve of Dr. Hogan's disagreement with the decision of the California State Supreme Court in concurring with the California Industrial Commission that the disease is compensable "simply because the incidence of the disease was higher among shipyard workers than in the rest of the population." The New York State workmen's compensation law states that "an injury means only an accidental injury arising out of or in the course of employment and such disease or infection as may naturally and unavoidably result therefrom." It would be difficult to interpret this law so as to include epidemic keratoconjunctivitis. I have heard a recent report from Detroit, where approximately only 250 cases were observed. Attention is called to my paper which has just appeared in the *New York State Journal of Medicine* (43:2049 [Nov. 1] 1943).

TOLUENE POISONING

CAPTAIN REX H. WILSON
MEDICAL CORPS, ARMY OF THE UNITED STATES

Toluene is a hydrocarbon, $C_6H_5CH_3$, also known as toliol and methyl benzene. It is a colorless, highly refractive inflammable liquid obtained from tolu and other resins and from coal tar. It boils at 110.4 C. and has an odor similar to that of benzene. It is insoluble in water and is miscible with alcohol, ether, chloroform, carbon disulfide and petroleum benzine. Its specific gravity is about 0.865 at 250 C. It dissolves iodine, phosphorus, sulfur and, when used in large amounts, resins and fats.

Toluene constitutes 2 to 10 per cent of commercial benzene. It is used extensively as a solvent in the rubber, lacquer and munitions industries. It affords an excellent solvent for certain types of synthetic rubber because it dries rapidly. It is used as a starting material in the manufacture of trinitrotoluene.

The pathologic manifestations of exposure to toluene (toluol) are a matter of controversy. The conclusions reached by various authors are in decided variance with one another.

For the past several years I have had an opportunity to study the effects of exposure to various types of fumes in a large industrial plant. The observations found in this paper are drawn from experience encountered in the handling of employees exposed to toluene fumes.

Toluene poisoning is usually caused by absorption of toluene through the respiratory tract, the skin and the alimentary tract. The absorbed fumes exert a progressive depressant action on the central nervous system and the bone marrow. The action is that of a narcotic. Toluene is also a pronounced irritant to mucous membranes. A factor to be considered whenever it is

employed is individual susceptibility. Some persons will tolerate concentrations of toluene ranging up to 200 parts per million for six to eight hours daily with no demonstrable ill effects. Exposure to concentrations of toluene from 200 to 500 parts per million for six to eight hours will in most persons cause tiredness and lassitude. Concentrations over 500 parts per million for one to three hours are definitely dangerous and will cause symptoms attributable to depression of the central nervous system and the bone marrow.

Approximately 1,000 employees were exposed to the fumes of commercial toluene in concentrations varying between 50 and 1,500 parts per million for periods of one to three weeks. One hundred employees, or 10 per cent of the total number of employees exposed, showed symptoms severe enough to cause them to present themselves to the hospital for examination. Ten of these patients, or 1 per cent of the total number of employees exposed, showed resultant blood changes. No fatalities occurred in the entire group of patients. The remainder of the exposed employees did not exhibit any symptoms attributable to the fumes. All employees working with toluene were kept under constant supervision, and all who presented any physical complaints were sent to the hospital for examination.

The exposed employees coming to the hospital were classified into groups by using the degree of exposure as a basis. The concentration of the toluene fumes at the job site was measured with a combustible gas indicator. The readings were taken shortly after any exposed person appeared at the hospital with symptoms. Three groups of patients were made: group 1, those patients who had been exposed to concentrations of toluene fumes up to 200 parts per million, group 2, those who had been exposed to concentrations of fumes from 200 to 500 parts per million, and group 3, those who had been exposed to concentrations of fumes over 500 parts per million.

Approximately 60 per cent of the patients fell into group 1. The chief complaints of this group were headache, lassitude and loss of appetite. Physical and laboratory examinations gave essentially negative results. Because the complaints and physical findings were not of a sufficient degree to be considered pathologically significant, the symptoms of this group of patients were considered to be due chiefly to psychogenic and other factors rather than to toluene fumes.

Group 2 constituted about 30 per cent of the total number. Their complaints were more numerous and more pronounced. Headache, nausea, bad taste in the mouth, anorexia, lassitude, slight but definite impairment of coordination and reaction time, and momentary loss of memory were the chief presenting symptoms. No significant physical or laboratory findings were noted.

Group 3 constituted about 10 per cent of the total number of patients. The chief complaints were nausea, headache, dizziness, anorexia, palpitation and extreme weakness. Loss of coordination was pronounced. Reaction time was definitely impaired. In several cases petechiae appeared under the skin.

In most of the cases all of the elements of the blood picture remained normal except the red cell count, which usually dropped to about 2,500,000 per cubic millimeter. In 2 cases leukopenia developed with white cell counts of 2,500 to 3,000 per cubic millimeter. In these 2 cases all of the other blood elements were reduced. The red cell count was lowered, and the platelet count was slightly decreased; the differential count showed the polymorphonuclear cells to be decreased and the monocytes increased; reticulocytes were decreased. Biopsy of the bone marrow in these 2 cases showed partial destruction of the blood forming elements. A diagnosis of aplastic anemia was made in these 2 cases.

Treatment of the first group of patients consisted in observation and reassurance. Because of the lack of findings it was felt that exposure to fumes of toluene in concentrations under 200 parts per million was not especially hazardous. Repeated physical and laboratory examinations were made on these patients. If the symptoms persisted, the patient was prohibited from working in fume departments.

Patients in group 2 were all considered to have potential aplastic anemia. Physical and laboratory examinations were done on these patients at frequent intervals. Multiple vitamin capsules and high vitamin, high caloric diets were prescribed. When the patients became symptom free they were permitted to return to work in a fume free department.

Patients in group 3 had serious poisoning. Fortunately they were few. All of them were immediately removed from the fumes. Most of them were unable to work at all. Some required hospitalization. A biopsy of sternal bone marrow was made for each one in this group. All whose bone marrow showed degeneration received whole blood transfusions at intervals regulated by the response. Usually the amount given at one transfusion was 250 cc. of whole blood. One patient with aplastic anemia received three whole blood transfusions, and one reecived five whole blood transfusions. The response was good in both. Before being given a transfusion the patient was alkalized with sodium or potassium citrate. Each patient in group 3 received 10 mg. of liver intramuscularly daily, large daily oral doses of liver, iron, calcium, phosphorus, yellow bone marrow and multiple vitamins, 400 to 600 mg. of ascorbic acid daily by mouth and a high vitamin, high caloric diet. Great care was taken to improve the patient's general hygiene. In the 2 cases of aplastic anemia absolute rest in bed was enforced and a constant watch was kept for secondary infection. In the other cases rest was an essential part of the treatment but absolute rest in bed was not insisted on.

After several weeks of rest, symptoms attributable to depression of the central nervous system began to clear up. Weakness was the most persistent symptom. Slight overexertion caused fatigue in one case of aplastic anemia several months after all other symptoms had disappeared.

Toluene may be assumed to be a dangerous chemical. Definite precautions should be taken whenever it is used. The following safeguards should be put into effect:

(*a*) The concentration of free fumes should never be more than 200 parts per million. The concentration should be ascertained frequently with a combustible gas indicator.

(*b*) Adequate ventilation must be installed to insure a fume concentration of less than 200 parts per million at any site where an employee might be working.

(*c*) New employees should be checked thoroughly before going to work in a department using toluene. Any evidence of blood dyscrasia or organic disease should be investigated and is usually sufficient cause to prevent that person from working in a fume department.

(*d*) Any person working with toluene who shows signs of illness should be seen by a physician. A com-

plete check-up should be made including a complete blood count. If the condition warrants, biopsy of the sternal bone marrow should be performed.

(*c*) Frequent adequate physical and laboratory examinations should be made on people working in toluene fumes. These should be made at least once a month where exposure is greater than 200 parts per million. The more frequent the examination, the less chance there is for poisoning to occur. Any change in physical status should be carefully investigated.

SUMMARY AND CONCLUSIONS

Of about 1,000 workmen exposed for from one to three weeks to toluene fumes varying in concentration from 50 to 1,500 parts per million, 100, or 10 per cent, showed symptoms attributable to toluene intoxication. Ten, or 1 per cent, showed blood changes. No deaths occurred. Treatment was symptomatic and included multiple whole blood transfusions, oral administration of liver, iron, calcium, phosphorus and yellow bone marrow and multiple vitamin therapy.

Toluene has a definite toxic effect on the human system. With concentrations over 200 parts per million symptoms attributable to intoxication of the central nervous system may occur, and with concentrations over 500 parts per million depression of the bone marrow may occur.

Adequate periodic examination of employees exposed to toluene fumes is valuable in the early discovery of cases of blood dyscrasia, and removal of the patients from the toxic environment and adequate therapy make it possible to return them to a normal state of health.

French Medical Education.—To Antoine François Fourcroy belongs the honor of setting in motion the legislation which gave rise to present day French medical education. He himself had obtained his medical degree in 1780 with great difficulty because of poverty. The 6,000 livres necessary for the diploma had been contributed by friends of the celebrated anatomist Vicq d'Azyr, who boarded with young Fourcroy's family. Fourcroy had welcomed the Revolutionary movement and the reforms it promised, but he was averse to entering the wild arena of practical politics and at first refused to accept any office. In spite of his protests he was elected a member of the Convention—one of the few physicians in this body—and here he devoted himself almost entirely to questions concerning education. Convinced of the necessity of a supply of physicians, chiefly for the army, he consulted Prieur, the member of the Committee on Public Safety in charge of the teaching of sciences and arts, asking him to recommend some one capable of collaborating in mapping out a scheme of organization for medical education. The name of François Chaussier was suggested. Chaussier was not a Parisian but had been prominent in medical circles in the provincial city of Dijon, holding appointments there not only as Surgeon of the Prisons and Physician of the Hospitals but also as Professor of Chemistry, and giving courses in anatomy and legal medicine. Because he sympathized with the idea of the Jacobins regarding the centralization of all power in Paris, he proposed the establishment in that city of a single Central School of Health. Jacobin principles, however, had just passed into disfavor, and members of the Convention agreed that similar schools should be established at Montpellier and Strasbourg. Fourcroy concurred and the decree was so worded. It is curious to note that when the government came to publish the text of the decree it prefaced it by a copy of Chaussier's report advocating a single Central School of Health in Paris. A few footnotes were added to the effect that the recommendations contained in the report were applicable to three schools as well as to a single one.—Olmsted, J. M. D., in Essays in Biology, Berkeley, University of California Press, 1943.

THE CLINICAL SIGNIFICANCE OF THE PLASMA VITAMIN A LEVEL

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AND
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The chemical determination of vitamin A in the blood has been simplified so that it can be carried out in any clinical laboratory. Apart from the changes of the plasma vitamin A in nutritional vitamin A deficiency there are well defined variations of the plasma vitamin A content in many diseases. These variations, not related to nutritional deficiency, appear more interesting since secondary, conditioned [1] or endogenous [2] vitamin deficiencies (due to processes within the organism) are as significant in medical practice as primary or exogenous due to reduced nutritional intake.

Two questions arise: 1. What determines the plasma vitamin A level? 2. How may a knowledge of this level be useful to the clinician?

We attempt to answer these questions on the basis of information gained from the literature and from observations on 2,673 vitamin A determinations on 454 patients.

In a statistical evaluation a t value [3] of 2.5 or over was considered a significant difference.[4] Our studies have been restricted to adults. As to children and infants, we refer to the extensive studies of Clausen and McCoord [5] and May, Blackfan, McCreary and Allen.[6] Since the carotenoid level is determined in the vitamin A assay, it will also be discussed.

METHOD FOR VITAMIN A DETERMINATION

If we exclude the spectrophotometric method, which is not widely used, almost all determinations of vitamin A in blood have been carried out by using the Carr-Price reaction (i. e. the blue color which a chloroform solution of vitamin A develops when antimony trichloride is added). If 4 cc.[7] of plasma is used, the final blue color is strong enough to be read either in the photoelectric colorimeter [8] or compared visually with copper sulfate standards.[9] In our experience [10] the two

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Statistical calculations and evaluation were done by Miss Elizabeth M. Adles.

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From the Herbert Institute for Medical Research and the Department of Therapeutics of the Cook County Hospital and the Departments of Pathology and Internal Medicine, University of Illinois College of Medicine.

1. Moore, T.: Vitamin A, Post-Grad. M. J. **17**: 52 (April) 1941.
2. Thiele, W.: Ueber das endogen bedingte vitamin A Defizit, Klin. Wchnschr. **19**: 1201, 1940.
3. t equals $\frac{x_1 - x_2}{\sqrt{\frac{s_1^2 + s_2^2}{n_1 + n_2}}}$ x is mean of determined values. s is standard deviation of determined values. n is number of cases examined.

If t of 2.5 is taken as level of significance, the P equals 0.01.

4. Snedecor, G. W.: Statistical Methods Applied to Experiments in Agriculture and Biology, Ames, Iowa, Collegiate Press, Inc., 1937.
5. Clausen, S. W., and McCoord, A. B.: The Carotinoids and Vitamin A of the Blood, J. Pediat. **13**: 635, 1938.
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8. Dann, W. J., and Evelyn, K. A.: The Determination of Vitamin A and Carotene with the Photoelectric Colorimeter, Biochem. J. **29**: 1008, 1938. Kothe, C. J., and Sherman, W. C.: The Determination of Vitamin A and Carotene with the Photoelectric Colorimeter, J. Biol. Chem. **127**: 327, 1940. Kimble.[11]
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10. Popper, Hans; Steigmann, Frederick; Meyer, K. A., and Zevin, S.: Relation Between Hepatic and Plasma Concentrations of Vitamin A in Human Beings, Arch. Int. Med. **72**: 439 (Oct.) 1943.

methods [11] have checked satisfactorily with each other. The copper sulfate standards or photolometer can be calibrated with crystalline vitamin A or with oily vitamin A concentrates. Crystalline vitamin A seems superior for calibration. It is, however, quickly oxidized. Recently well standardized vitamin A concentrates have become available which are superior for calibration because of the stability and low price of the product, permitting thus repeated recalibrations.[12] The vitamin A values are recorded either in micrograms per hundred cubic centimeters of plasma as chemical value or in units as a biologic value depending on the response of vitamin A deficient animals. The conversion factor from micrograms to units varies with the biologic potency of the preparation, that of crystalline vitamin A alcohol being higher than that of vitamin A oil concentrates. The conversion factor of the standardized oil is according to the specification given 3.28. In the first phase of our studies the calibration was done with crystalline vitamin A but was rechecked with the standard oils. Because of the variability of the biologic assay, all values are recorded as micrograms.

Since carotene also reacts with antimony trichloride, most investigators made, in their final calculation, a deduction for the color due to carotene. However, since the carotene color develops much slower than that of vitamin A, this deduction is not quite accurate. Furthermore, it is doubtful that the color ascribed to carotene is entirely due to it and not to other carotenoids, especially in pathologic conditions. In our material, therefore, no deduction has been made for the carotenoid color, which may explain why our figures for vitamin A are somewhat higher than those reported by others. Levels below 4 micrograms were considered zero levels.

WHAT FACTORS VARY THE PLASMA VITAMIN A LEVEL?

1. *Nutritional Intake of Vitamin A.*—Many months are required to decrease significantly the blood vitamin A level of normal adults by withdrawal of vitamin A from the food, whereas the carotene level begins to drop sooner.[13] Prolonged malnutrition reduces the vitamin A level;[14] among the poorer part of the population the blood level is usually lower than in the economically better stratum.[15] Not much is known as to the blood vitamin A level; in clinical nutritional avitaminosis A in deficient animals it is reduced.[16] In individuals with signs of vitamin A deficiency the vitamin A level is not necessarily lowered.[17] On the other hand the intake of large doses of vitamin A increases the blood level temporarily.[18]

2. *Disturbances of Intestinal Absorption of Vitamin A.*—In conditions associated with disturbances of intestinal absorption, low plasma vitamin A levels are common (celiac disease,[19] sprue,[20] colitis,[21] pyloric obstruction,[22] pancreatic fibrosis and congenital atresia of bile ducts,[6] intestinal obstruction,[23] severe pulmonary tuberculosis [24] and infantile eczema [25]). In these conditions, to which liver disease [18] may be added, the response of the plasma vitamin A level to the intake of high doses of vitamin A (tolerance curve) is also inadequate.

3. *Increased Demand for Vitamin A.*—An increased demand for vitamin A is still a question. The otherwise somewhat constant requirements are doubtlessly increased in pregnant and lactating women.[26] Whether the requirements of infants are higher than of adults is doubtful.[27] Increased demands have also been presumed in hyperthyroidism [28] and infections [29] and have been found in choledochocolonostomized rats.[30]

4. *Disturbed Interaction of Liver and Blood.*—Normally the blood vitamin A level is maintained by the liver, which is its chief depot in the body.[31] In pathologic conditions this regulation may fail.[32] In pneumonia low blood levels have been found in patients whose liver at a later autopsy contained normal amounts of vitamin A.[33] In liver damage a similar discrepancy

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29. Josephs, H. W.: Vitamin A and Total Lipid of the Serum in Pneumonia, Am. J. Dis. Child. **65**: 712 (May) 1943.

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33. Lindqvist, T.: Studien über das Vitamin A beim Menschen, Acta med. Scandinav., 1938, supp. 97, p. 1.

between liver depots and blood levels may occur.[10] On the other hand an increased mobilization of vitamin A from the liver may take place under the influence of alcohol [34] or by sympathicoadrenal stimulation.[35]

5. *Miscellaneous Factors.*—Among the factors which influence the vitamin A metabolism, vitamin E [36] has come to the foreground. As antioxidant in the intestine and also in the tissues, it counteracts the oxidative destruction of vitamin A. Furthermore, the lipid concentration of the blood has been considered important, since the lipids are probably the carriers of vitamin A.[37]

RESULTS

Normal Plasma Vitamin A Levels.—As a result of the relation between the nutritional status and the plasma vitamin A level, economic conditions influence the latter. The values of plasma vitamin A and carotenoid in normal subjects (doctors and nurses) agreed with those reported in the literature.[38] The previously described sex difference in vitamin A and carotenoids was also apparent, in men the average vitamin A being 58 micrograms per hundred cubic centimeters of plasma and the carotenoids 74 micrograms with a vitamin A/carotene ratio of 0.78. In women the average vitamin A was 47 micrograms per hundred cubic centimeters of plasma and the carotenoids 85 micrograms, the ratio being 0.57.

To evaluate the significance of the plasma vitamin A levels of patients who suffer from various diseases in

TABLE 1.—*Plasma Vitamin A and Carotenoid Levels and Vitamin A/Carotenoid Ratio in Normal Persons and in Hospital Controls*

Diagnosis	Number of Cases	Plasma Vitamin A Level (in Micrograms per 100 Cc.) Maximum	Minimum	Mean	Plasma Carotenoid Level (in Micrograms per 100 Cc.) Maximum	Minimum	Mean	Vitamin A/Carotenoid Ratio
Normals	27	82	29	46	150	42	81	0.64
Hospital controls:								
Fractures	20	95	13	33	114	24	69	0.59
Hernias	9	44	20	34	110	5	46	1.32
Compensated (cardiac and arthritic)	37	75	9	35	135	12	57	0.76
Combined hospital controls	65	95	9	32	135	5	59	0.78

TABLE 2.—*Plasma Vitamin A and Carotenoid Levels and Vitamin A/Carotenoid ratio in Patients with Diseases of Biliary Tract or Liver with Statistical Comparison (t Value) to Hospital Controls*

Diagnosis	Number of Cases	Plasma Vitamin A Level (Micrograms per 100 Cc.) Maximum	Minimum	Mean	t Value	Per Cent of Cases with Zero Vitamin A Level	Plasma Carotenoid Level (Micrograms per 100 Cc.) Maximum	Minimum	Mean	t Value	Mean Vitamin A/Carotenoid Ratio	t Value
Gallbladder disease	26	88	7.3	31	0.1	0	147	0	71	0.7	0.35	3.0
Incomplete biliary obstruction without hepatitis	7	40	1.8	22	1.5	0	88	15	59	0.62	0.77	0.9
Incomplete biliary obstruction with hepatitis	7	15	0	2.7	10.8	71	161	18	69	0.5	0.08	8.0
Malignant complete biliary obstruction with hepatitis	16	20	0	4.6	11.0	53	325	5	82	1.2	0.22	3.6
Cirrhosis without jaundice	25	32	0	11	5.7	12	217	0	49	0.5	0.31	2.4
Decompensated cirrhosis with jaundice	35	16	0	3.1	12.8	64	166	0	61	0.2	0.04	8.8
Hepatitis in fully developed stage	17	10	0	2.5	14.0	65	94	9	51	0.5	0.07	6.2
Hepatitis in recovered stage	10	78	18	40	1.6	0	175	39	74	0.5	0.60	0.5

TABLE 3.—*Plasma Vitamin A and Carotenoid Levels and Vitamin A/Carotenoid Ratio in Patients with Various Diseases, with Statistical Comparison (t Value) to Hospital Controls*

Diagnosis	Number of Cases	Plasma Vitamin A Level (Micrograms per 100 Cc.) Maximum	Minimum	Mean	t Value	Per Cent of Cases with Zero Vitamin A Level	Plasma Carotenoid Level (Micrograms per 100 Cc.) Maximum	Minimum	Mean	t Value	Mean Vitamin A/Carotenoid Ratio	t Value
Peptic ulcer and benign gastrointestinal diseases	40	101	9.2	27	0.8	0	117	0	58	0.6	0.72	0.2
Carcinoma of stomach	33	56	0	18	2.8	3	177	0	57	0.1	0.51	1.5
Anemias	15	44	0	17	2.4	7	87	0	38	1.5	0.68	0.5
Diabetes mellitus	12	53	0	27	0.5	8	300	18	98	1.0	0.51	1.1
Hyperthyroidism	5	61	17	35	0.1	0	90	29	57	0.06	0.60	0.5
Pneumonias	20	127	0	15	2.8	50	75	6	39	1.1	0.39	1.9
Infections	10	71	0	22	2.6	9	73	0	33	1.8	0.69	1.6
Severely sick patients	7	16	7.3	11	4.2	0	48	12	31	1.9	0.48	1.5
Renal diseases	20	193	13	82	2.2	0	255	0	101	1.4	1.16	1.0
Essential hypertension	19	73	18	36	0.6	0	111	21	57	0.1	0.78	0.05
Diseases with established vitamin A deficiency	3	0	0	0	10.5	100	18	0	7	11.0	0.00	7.3

34. Clausen, S. W.; Baum, W. S.; McCoord, A. B.; Rydeen, J. O., and Breese, R. B.: The Mobilization by Alcohols of Vitamin A from Its Stores in the Tissues, J. Nutrition **24**: 1, 1942. Clausen, Breese, Baum, McCoord and Rydeen.[9]

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37. Josephs, H. W.: Studies on Vitamin A: Influence of Vitamin A on Serum Lipids of Normal and Deficient Rats, Bull. Johns Hopkins Hosp. **71**: 263, 1942. Josephs (footnotes 9 and 29). Wendt.[40]

38. Murrill, W. A.; Horton, P. B.; Leiberman, E., and Newburgh, L. H.: Vitamin A and Carotene: Vitamin A and Carotene Metabolism in Diabetics and Normals, J. Clin. Investigation **20**: 395, 1941. Kimble,[21] Abt, Aron, Bundesen, Delaney, Farmer, Greenbaum, Wenger and White,[41] Abels, Gorham, Pack and Rhoads,[42] Getz and Koerner.[43]

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a charity hospital and who are of a lower economic stratum we used, as controls, patients with hernia or fracture or those convalescing from a heart disease, since in them no changes in the vitamin A metabolism can reasonably be assumed (table 1). Owing to technical reasons, almost all our patients were male; the hospital controls, therefore, were also male patients.

Physiologic Variations of the Plasma Vitamin A Level.—In 5 cases plasma vitamin A and carotenoid levels were determined four times in twenty-four hours without significant variations, confirming previous reports.[39]

In 7 hospital controls without any signs of disturbed vitamin A metabolism the plasma vitamin A was determined daily for seven to eighteen days without any considerable changes being found, as observed before.[6] The variations of the carotenoid level were much more pronounced (table 4).

Vitamin A Level in Diseases of the Liver and Biliary Tract.—In uncomplicated gallbladder disease (without jaundice or infection) plasma vitamin A and carotenoid levels were within the normal average (table 2). In incomplete extrahepatic biliary obstruction (due to stone or stricture) but without evidence of liver damage as seen from the results of liver function tests (oral hippuric acid test, cephalin-cholesterol flocculation, cholesterol/cholesterol ester ratio, quantitative urobilinogen

TABLE 4.—*Variation of the Plasma Vitamin A and Carotenoid Levels in Hospital Controls in Serial Examinations*

Length of Examination Period (Days)	Number of Determinations	Plasma Vitamin A Level (Micrograms per 100 Cc.) Variation From	To	Mean	Plasma Carotenoid Level (Micrograms per 100 Cc.) Variation From	To	Mean
18	9	19	27	23	51	114	97
12	11	10	15	12	48	51	50
15	9	29	39	34	69	126	90
10	9	34	38	43	42	54	49
14	12	28	39	34	90	126	105
18	10	49	61	55	87	96	90
7	4	24	29	27	93	105	101

excretion in urine and feces) the average plasma vitamin A level was somewhat but not significantly lower than normal, while the carotenoid level was increased. In similar types of cases but with evidence of secondary hepatitis and impairment of the liver function the plasma vitamin A level was considerably reduced and in a great number of cases zero levels were found. In patients with complete biliary obstruction due to a malignant tumor and associated with secondary hepatitis the plasma vitamin A level also was low. There was a significant statistical difference in the vitamin A (but not in the carotenoid) levels of the patients with incomplete biliary obstruction without hepatitis to those of patients with incomplete biliary obstruction with hepatitis as well as to those of patients with complete biliary obstruction with hepatitis. There was no statistically significant difference between plasma vitamin A levels of cases with incomplete and of patients with complete obstruction with hepatitis (table 5).

In comparison with the hospital controls, patients with cirrhosis of the liver without jaundice showed a moderately decreased average plasma vitamin A level. This group comprised two types of patients:

1. Eight patients with arrested (compensated) cirrhosis whose only signs were cirrhotic habitus, enlargement of the liver and spleen and slight disturbance of the liver function. These had an average plasma vitamin A of 18 micrograms per hundred cubic centimeters and carotenoid of 66 micrograms, the vitamin A/carotenoid ratio being 0.28.

TABLE 5.—*Statistical Comparison (t Value of Plasma Vitamin A, Carotenoid and Vitamin A/Carotenoid Ratio in Different Liver Diseases*

(See Table 2)

Comparison Between	Number of Cases	t Value Vitamin A	t Value Carotenoid	t Value Vitamin A/Carotenoid Ratio
Incomplete obstructive jaundice without hepatitis	7			
and Incomplete obstructive jaundice with hepatitis	7	3.0	0.4	2.4
Incomplete obstruction without hepatitis	7			
and Complete obstructive jaundice with hepatitis	16	2.9	1.65	1.6
Incomplete obstruction with hepatitis	7			
and Complete obstructive jaundice with hepatitis	16	0.9	0.5	1.4
Cirrhosis without jaundice	25			
and Cirrhosis with jaundice	35	2.7	0.5	2.9

2. Sixteen patients with decompensated cirrhosis as manifested by ascites, edema, spider nevi, esophageal bleeding and manifest impairment of liver function. These had an average plasma vitamin A level of 11 micrograms per hundred cubic centimeters and carotenoid of 72, the ratio being 0.15.

In progressive cirrhosis with jaundice and hepatitis, an even more definite reduction in the average plasma vitamin A level was seen. The clinical or anatomic type of cirrhosis is less important than the degree of liver damage as determined from the liver function tests. Statistically the difference between cirrhosis with and without jaundice was significant (table 5).

TABLE 6.—*Variations of the Plasma Vitamin A Level During the Course of Liver Disease*

Diagnosis	Number of Cases	Average Days of Observation	Average Number of Determinations	Average Plasma Vitamin A Level in Micrograms per 100 Cc. On Entrance to Hospital	During Highest Peak	When Leaving Hospital
Patients with return to normal	9	47	5	6	23	22
Patients reaching high levels (41-217 micrograms) in course of disease	12	87	10	21	73	51
Patients with fluctuation during observation (no complete recovery)	16	37	8	10	18	12
Patients with stationary zero levels	4	29	11	0	0	0
Patients with downhill course	1	34	10	12	12	0

In acute hepatitis at the height of the disease the plasma vitamin A level was very low. In patients with hepatitis who came under observation during the stage of recovery the average plasma vitamin A level was above normal.

In some cases with liver damage, plasma vitamin A levels of zero were found, the incidence paralleling the degree of liver damage. Zero plasma vitamin A levels

39. Getz, H. R., and Koerner, T. A.: Vitamin A and Ascorbic Acid in Pulmonary Tuberculosis: Determination in Plasma by the Photoelectric Colorimeter, Am. J. M. Sc. 202:831, 1941. May, Blackfan, McCreary and Allen.[6] Lindqvist.[38]

were found in 53 to 71 per cent of the cases with hepatitis—whether they were primary or secondary because of incomplete or complete biliary obstruction and with progressive cirrhosis. The carotenoid levels did not show any significant variation from the normal and the statistically significant changes of the vitamin A/carotenoid ratio appeared when the vitamin A level was low. These changes were most accentuated in conditions with severe liver damage.

Variations in the Plasma Vitamin A Level in the Course of the Disease.—Vitamin A determinations were made on 37 patients with liver disease in the course of the disease (table 6). Various types of curves of the plasma vitamin A level were obtained during the period of observation. In 9 cases a gradual increase of the plasma vitamin A level to approximately normal occurred synchronously with more or less complete recovery. In 12 recovered patients (the majority of them from acute hepatitides) the plasma vitamin A level rose to a high peak before it declined to the normal level. Of the patients who did not recover, 16 showed an irregularly fluctuating plasma vitamin A level and 4 had constantly zero levels throughout the entire period of observation. In the two latter groups were mostly patients with decompensated cirrhosis. One patient with complete malignant obstruction showed a constant decrease in the plasma vitamin A level.

Plasma Vitamin A Levels in Various Clinical Conditions (exclusive of biliary tract and liver disease).—The plasma vitamin A and carotenoids levels and the vitamin A/carotenoid ratio in patients with peptic ulcer was normal.[38] In carcinoma of the stomach, however, the plasma vitamin A level was lowered with statistical significance, the carotenoid level remaining unchanged (in agreement with previous observations[40]). In patients with anemia (with red cell count below 3 million) due to pernicious anemia, blood dyscrasias or

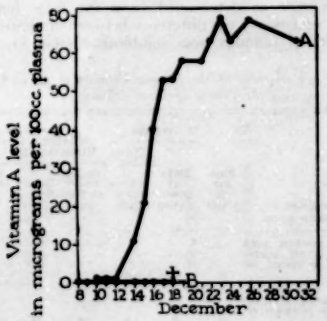

Chart 1.—Plasma vitamin A levels of 2 patients with pneumonia: *A*, recovering; *B*, fatal outcome.

bleeding ulcer, the plasma vitamin A level was somewhat below normal (on the borderline of statistical significance) the carotenoid only slightly reduced.[41] In diabetic patients the average plasma vitamin A level was not significantly reduced. The variations between maximum and minimum, however, were great; in 1 patient even a zero level was encountered. The carotenoid levels were occasionally above normal, the average not deviating from the normal. Thus only some of our cases showed the behavior described in the American literature[42] (low plasma vitamin A

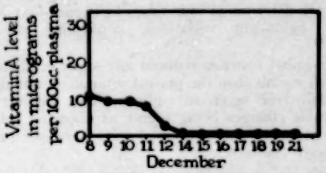

Chart 2.—Plasma vitamin A level of a patient with carcinoma of the rectum in terminal stage.

levels associated with increased carotenoid levels) whereas the others coincided with reports from abroad.[43] In hyperthyroidism no significant variations were noted, in contrast to earlier reports.[44] In lobar pneumonias the plasma vitamin A levels were on the average low and in 38 per cent zero. Toxic patients showed very low or zero levels. The carotenoid level appeared reduced also, though not statistically significant. In other pyogenic infections a similar tendency was seen. In patients severely sick from various causes (not enumerated in this tabulation) the plasma vitamin A level was low and the carotenoid level reduced. In cases of nephritis or malignant nephrosclerosis with renal insufficiency the plasma vitamin A level was usually high, the average being almost three times that of the normal. However, since not all cases showed increased, some even reduced, values the increase reached only the borderline of statistical significance. The carotenoid levels also were somewhat higher than normal but likewise without statistical significance because of the wide range of the figures. In uncomplicated hypertension, however, no deviation from the normal was found, which is interesting in view of a recent discussion on a possible beneficial effect of large doses of vitamin A in hypertension.[45]

A woman with nontropical sprue and a young girl with nutritional vitamin A deficiency represent our cases of deficiency disease. Both showed plasma vitamin A levels of zero and extremely low carotenoids, the vitamin A/carotenoid ratio being changed accordingly.

Changes in the Plasma Vitamin A Level in the Course of Various Diseases.—The alterations of the plasma vitamin A level in the course of disease were characteristic in patients who recovered or in those who had a downhill course. The changes during recovery were studied in 7 patients with pneumonia or infection and an average of eight determinations each were made

40. Abels, C. A.; Gorham, A. T.; Pack, G. T., and Rhoads, C. P.: Metabolic Studies in Patients with Cancer of the Gastrointestinal Tract: I. Plasma Vitamin A Levels in Patients with Malignant Neoplastic Disease, Particularly of the Gastrointestinal Tract, J. Clin. Investigation **20**: 749, 1941. Thiele and Scherff.[39]

41. Abt, A. F.; Aron, H. C. S.; Bundesen, H. N.; Delaney, M. A.; Parmer, C. J.; Greenebaum, R. S.; Wemper, O. C., and White, J. L.: Studies on Plasma Vitamin A: II. Relationship of the Plasma Vitamin A to Pregnancy and Anemia in Syphilitic Patients, Quart. Bull., Northwestern Univ. M. School **16**: 245, 1942.

42. Stueck, G. H.; Flaum, Gerald, and Ralli, Elaine P.: Serum Carotene in Diabetic Patients, with Clinical Evidence of Carotenemia as Determined by Photo-Electric Colorimeter, J. A. M. A. **109**: 343 (July 31) 1937. Ralli, Elaine P.; Parisette, A. C.; Brandeberg, Harold, and Davidson, Sidney: Effect of Carotene and Vitamin A on Patients with Diabetes Mellitus: Effect of Daily Administration of Carotene on the Blood Carotene of Normal and Diabetic Individuals, ibid. **106**: 1975 (June 6) 1936. Heymann, Walter: Carotenemia in Diabetes, ibid. **106**: 2050 (June 13) 1936.

43. Wendt, H.: Hypercholesterinaemie und Vitamin A, Deutsche med. Wchnschr. **63**: 1213, 1936. Lindqvist.[44] Thiele and Scherff.[39]

44. Clausen and McCord.[9] Wendt.[43] Thiele and Scherff.[39] Lindqvist.[44]

45. Weberling, G. E., and Moss, W. G.: Treatment of Experimental Renal Hypertension with Vitamin A Concentrates, Proc. Soc. Exper. Biol. & Med. **53**: 149, 1943.

within sixteen days; the plasma vitamin A level returned gradually to normal, and in 2 patients values above normal (i. e. 69 micrograms per hundred cubic centimeters) were found. Two patients with pneumonia showed persistently zero levels on ten and four daily determinations respectively; both patients died (chart 1). Three patients (2 with carcinoma and 1 with miliary tuberculosis) showed a decrease of the plasma vitamin A level during observation parallel with a general decline in their condition (chart 2).

COMMENT

The plasma vitamin A level is constant under physiologic conditions during the day, and on consecutive days in controls on an average hospital diet. Changes of the plasma vitamin A level are therefore significant, their clinical implication depending on the underlying disease.

Liver Disease.—A reduction of the plasma vitamin A level was described in acute hepatitis [46] and in cirrhosis,[47] in the latter as a crude index of the disease process. In our series the drop of the plasma vitamin A runs fairly parallel to the degree of liver damage. Low mean vitamin A levels and even zero levels were encountered in the diseases in which the degree of liver damage is advanced (secondary hepatitis due to biliary obstruction caused by stones or tumor, decompensated cirrhosis with jaundice, or toxic hepatitis in the fully developed stage). The reduction of the plasma vitamin A is less conspicuous in cirrhosis without jaundice, with distinct difference between progressive and arrested forms. In incomplete biliary obstruction without hepatitis the reduction of the plasma vitamin A level is moderate, whereas in simple gallbladder disease the level is normal. This, supported by a statistically significant difference between the groups of biliary obstruction with and without hepatitis and of cirrhosis with and without jaundice (the latter indicating superimposed hepatitis), points to reduction of the vitamin A level as a clinical sign of impaired liver function. The drop of the vitamin A level is not parallel to the degree of jaundice as seen from the difference between the relatively high plasma vitamin A level in obstructive jaundice without hepatitis, and the low level in cirrhosis, often with slight icterus. A plot of individual vitamin A levels against the icterus index shows no relation, the low levels in patients with jaundice paralleling the degree of liver damage. The drop of the plasma vitamin A level may hence be of diagnostic and prognostic value in liver disease. The prognostic importance is shown by observations made for several weeks; in clinical recovery the plasma vitamin A level rises to normal or even higher than normal, whereas in a downhill course it progressively decreases. The determination of the plasma vitamin A level may thus serve as an additional aid in evaluating liver function, although the occasionally high levels in the recovery stage may be confusing.

What causes the low plasma vitamin A level in liver disease? The most obvious cause seems to be impairment of intestinal absorption of vitamin A [48] which runs parallel to the extent of liver damage.[49] Intestinal absorption damage alone, however, does not explain the drop of the vitamin A level within a few days in acute hepatitis, since lack of vitamin A intake reduces the vitamin A level only after some months.[15] Therefore, as other factors the inability of the liver to store vitamin A or increased demand for vitamin A should be considered. In both instances the liver depots should be depleted of vitamin A. This is the case in cirrhosis,[49] whereas in acute liver damage the liver is not always depleted but may show considerable vitamin A stores.[50] Liver biopsy specimens may show considerable amounts of vitamin A, even if the blood is free of it.[51] The distribution of vitamin A in the liver, however, as seen under the fluorescence microscope is materially changed.[52] The vitamin A fluorescence has shifted from its normal sites (fine lipid droplets on the edge of the liver cells and the Kupffer cells) to pathologic areas in the liver such as fat droplets of various size. From here vitamin A is less readily discharged and therefore less available for utilization.[53] Seemingly the normal liver maintains the vitamin A level of the blood and prevents its decrease (for a limited time) even if the nutritional supply is withheld. In liver damage this regulation fails because of the shift of vitamin A to pathologic sites. The hemeralopia [54] described in liver disease is thus the result of functional avitaminosis A developing despite non-depleted liver stores. In chronic liver disease both disturbed absorption and disturbed regulation lower the plasma vitamin A level. Since both factors are related to liver damage, the plasma vitamin A level may indicate the degree of liver damage.

We found no evident relation of the plasma carotenoid level to liver damage, although the liver carotene stores are reduced.[55] The average levels do not deviate especially from the norm. That the vitamin A/carotenoid ratio decreases significantly in liver disease seems more due to decrease of the vitamin A level than to impaired conversion of carotene to vitamin A, as has been assumed.[47] Both the vitamin A and carotenoid levels depend on the efficiency of intestinal absorption, whereas the vitamin A level depends also on liver regulation. Our data emphasize the significance of the impaired regulation for the low plasma level in liver disease. However, the unspecificity of the carotenoid determination, as carried out with the colorimetric method, does not permit far reaching conclusions.

During recovery from acute hepatitis the vitamin A level rises not only to normal but temporarily even beyond it.[56] This compensatory hypervitaminemia in

46. Lamb, F.: Ueber den Vitamin A Spiegel im Blute bei Leberkrankheiten, Klin. Wchnschr. 17: 1107, 1938. Clausen and McCoord.[5] Lindqvist.[29]

47. Haig, C., and Patek, A. J., Jr.: Vitamin A Deficiency in Laennec's Cirrhosis: The Relative Significance of the Plasma Vitamin A and Carotenoid Levels and the Dark Adaptation Time, J. Clin. Investigation 21: 369, 1942.

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convalescence may explain previous findings of a high vitamin A level in liver disease.[57] Whether it is due to improved intestinal absorption coinciding with inability of the liver to store the increased amount [58] or to mobilization of the vitamin A from the pathologic sites during the recovery of the liver parenchyma will have to be decided. At any rate the hypervitaminemia is a prognostic sign of recovery.

Infectious Disease.—Previous reports of low plasma vitamin A levels in patients with various infections [59] and with lobar pneumonia [60] were confirmed by our results. They do not indicate that fever is the only responsible factor.[61] The phenomenon is possibly caused by liver changes secondary to infection or especially lobar pneumonia, which interfere with the normal relation between blood and liver.[62] As in liver disease the vitamin A level rises in the recovery stage of pneumonia. [63] The prognostic value of the plasma vitamin A level, especially when repeatedly determined, is evident: a rise indicates improvement, constant zero levels point to a fatal outcome. In infections and pneumonia, as in liver disease, the vitamin A/carotenoid ratio does not indicate a disturbed conversion of carotene as the cause of the low vitamin A levels. In pneumonia the carotenoid level is also reduced, probably because of reduced food intake.

Debilitating Diseases.—Low vitamin A levels are found not only in specific absorption impairment, liver damage or infections but also in other debilitating conditions characterized by general malaise and severe sickness.[64] In these the low plasma vitamin A levels are probably caused by a combination of impaired absorption and reduced nutrition and liver damage among other factors. Clinically the vitamin A level may be here of value to indicate the general condition.

Renal Disease.—High plasma vitamin A levels in patients with renal disease seem peculiar but are reported also by others.[65] They are puzzling since, in contrast to normal persons, patients with kidney damage excrete vitamin A in the urine [66] and since the liver depots are low in vitamin A.[67] In renal disease, vitamin A is also found morphologically in the kidney parenchyma.[68] Furthermore, although impairment of the intestinal absorption of vitamin A might be expected in renal disease, we found in many instances a normal or better than normal absorption.[69] This paradox behavior of vitamin A in kidney disease resembles that of cholesterol, the blood level of which is also increased despite its being excreted in the urine and deposited in the kidney. Further investigations on the intestinal absorption of lipids in kidney disease and on the influence of the renal tubules on the blood lipid concentration [70] are indicated.

Also during pregnancy and especially in its later stage, the plasma vitamin A level is low.[71] Recently the conditions in pregnancy have been thoroughly investigated.[72]

From this comment it is evident that low plasma vitamin A levels are found in a variety of diseases independent of the nutritional intake. In pneumonia or in acute hepatitis the plasma vitamin A level may drop in a matter of days. Avitaminemia, which could be considered as functional avitaminosis A,[10] may thus develop rapidly without any relation to a disturbed nutritional intake. Possibly a similar temporary functional avitaminosis A may occur, despite normal nutritional intake, in persons (for instance members of the armed forces) exposed to great exhaustion and extreme climatic conditions, which may likewise disturb the normal relation between liver and plasma vitamin A.

SUMMARY AND CONCLUSION

The clinical significance of the plasma vitamin A determination in diseases of the adult is discussed on the basis of statistically evaluated examinations and on perusal of the literature. Under physiologic conditions and with normal nutrition, the vitamin A level is constant at certain times of the day and on consecutive days. Aberrations of the plasma vitamin A level, therefore, assume significance. In liver disease the plasma vitamin A level is sharply lowered, often to zero. The reduction parallels the degree of liver damage and not the degree or type of jaundice. In the course of recovery the plasma vitamin A returns to normal or even high levels. The vitamin A determination may help, therefore, in the diagnosis and prognosis of liver disease. The reduction of the vitamin A level in liver disease is due partly to impaired intestinal absorption and partly to disturbed release of vitamin A from the liver, both in turn depending on the degree of liver damage. In infection the plasma vitamin A level is reduced, especially in lobar pneumonia, zero levels being found usually during the toxic stage of the disease. Repeated determinations of the vitamin A level are of prognostic value. The plasma vitamin A level is also lowered in various other conditions (e. g. anemia, gastrointestinal carcinoma), especially in severely sick patients. The reduction of the plasma vitamin A level in the latter renders it a nonspecific index of the general condition. In kidney disease the vitamin A level is often much increased. Hypovitaminemia A may rapidly develop and is in this country more commonly caused by processes within the body than by faulty nutrition.

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Clinical Notes, Suggestions and New Instruments

AMINOPHYLLINE DEATHS

GEORGE ADAMS MERRILL, M.D., BROOKLYN

During the past year the use of aminophylline intravenously in cases of cardiac failure and in bronchial asthma when epinephrine and other remedies are ineffectual has been frequently reported. That the results are often most satisfactory is true. That its use is also not without danger is also true, as a recital of the following cases will demonstrate:

REPORT OF CASES

M. G., a man aged 52, whose previous history was irrelevant, was pronounced normal as the result of a hospital check-up, including an electrocardiogram, twelve months ago. At 2 p. m., while finishing luncheon, he was seized with severe precordial pain. The hotel physician on examining him made a diagnosis of acute coronary closure, and, feeling that he was too ill for removal to a hospital, had him carried to a room, where he was put to bed. When I saw him, at 6 p. m., he was still in profound shock, the blood pressure was 100/50 and the heart sounds were faint, with the suggestion of a pericardial murmur. There were signs of beginning pulmonary edema. The usual treatment, including morphine and oxygen by the tent method, had been instituted. A 10 cc. vial containing 0.25 Gm. of aminophylline was aspirated into a syringe and the needle inserted into the antecubital vein. About 4 cc. had been slowly injected when an expression of pain came over the man's face, his arms were brought up across his chest, almost immediately his respirations stopped, and after a few fluttering sounds at the cardiac area his heart also ceased to beat.

C. N., a man aged 73, admitted to the King's County Hospital on Feb. 16, 1942, had had numerous attacks of bronchial asthma over a period of years. There was no history of dyspnea on effort, no skin edema or precordial distress. The admission diagnosis was status asthmaticus. The blood pressure was 200/90, the pulse rate 120, the heart sounds of poor quality; no murmurs were heard. The examination of the lungs showed the typical signs of bronchial asthma. A bedside x-ray examination showed bronchiectasis. Digitalization was started. Epinephrine 0.5 cc. gave relief at first and was repeated every four hours. After four doses it was no longer effectual. Enclosure in an oxygen tent gave no relief. Finally at 3 p. m. on February 17 0.25 Gm. of aminophylline dissolved in 10 cc. of 10 per cent dextrose was injected slowly into the antecubital vein by the resident physician. Within thirty seconds his respiration ceased and no heart sounds could be heard. Intracardiac epinephrine 1 cc. was used. The patient was pronounced dead at 3:05 p. m.

M. H., a man aged 70, admitted to the Caledonian Hospital with a history of acute cardiac decompensation, had never shown any sign of heart disease and had not consulted a doctor for years. A 2 meter x-ray plate showed a cor bovinum. An electrocardiogram disclosed left ventricular preponderance. Blood chemistry, blood count and urine examination were normal. The usual treatment for cardiac failure was instituted, without improvement, as described in the preceding cases. The patient died almost immediately as before described.

COMMENT

I have seen syncope, cardiac palpitation and extreme dilatation of the pupils in a number of young patients suffering from status asthmaticus and treated with intravenous aminophylline. The symptoms were only temporary.

Since I wrote the foregoing, 2 other cases of sudden death after the use of intravenous aminophylline have been reported to me verbally by an intern who was "riding bus" at another Brooklyn hospital. The patients were treated at home, on ambulance calls. In each case bronchial asthma was diagnosed, aminophylline was administered as described, and death was immediate. No particulars are at hand on these cases.

CONCLUSIONS

While not condemning the use of aminophylline intravenously, I feel that it should be used only when safer drugs have failed to give relief. Our hospital rule is that it may be ordered only by one of the attending staff or by the resident physician, that not more than 0.24 mg. may be used and that it be dissolved in 50 cc. of 5 per cent dextrose and given by the gravity method over a period of ten minutes, during which time the doctor should stand by.

The cause of death in these cases is unknown and will remain so until autopsies are obtained, which might clear up the question. The suddenness of the death resembles that seen when epinephrine hydrochloride has been given undiluted intravenously, in which case death has been due to ventricular fibrillation.

816 Ocean Avenue.

ACTINOMYCOSIS TREATED WITH SULFADIAZINE

LIEUTENANT COLONEL WILLARD F. HOLLENBECK
MEDICAL CORPS, ARMY OF THE UNITED STATES
and
LIEUTENANT DAVID TURNOFF
MEDICAL CORPS, ARMY OF THE UNITED STATES

Any agent that influences the course of actinomycosis favorably is worthy of note. The benefit achieved by sulfadiazine in a case under our care seemed so remarkable that we were moved to place it on record.

REPORT OF CASE

A Negro soldier aged 38 who had been inducted into the U. S. Army on Nov. 10, 1942 was transferred to the Moore General Hospital, Swannanoa, N. C., on Feb. 4, 1943 from a station hospital where he had been hospitalized from Dec. 24, 1942 to Jan. 26, 1943 and again from January 30 to February 4.

On admission to the Moore General Hospital he gave the history that in November 1941 he had developed a small lesion on the left side of his jaw. This lesion enlarged in a few days until a full blown abscess was present. The patient consulted a dentist, who felt that his teeth were responsible and therefore extracted all the teeth in the left lower jaw. This procedure did not seem to influence the abscess but soon it opened spontaneously and some sanguineous purulent material escaped.

Blood Count, Sedimentation Rate and Sulfadiazine Level

Date	Red Blood Cells	Hemoglobin, %	White Blood Cells	Polymorphonuclears, %	Sedimentation Rate, Mm. in 1 Hour	Blood Sulfadiazine Level, Mg. per 100 Cc.
2/ 5/43	4,610,000	95	6,850	72	22	
2/ 9/43	3,300,000	72	13,400	72	..	2.5
2/ 8/43	4,020,000	85	15,800	79	..	1.86
2/11/43	4,490,000	90	12,500	73	..	3.4
2/18/43	4,640,000	95	12,950	76	..	6.4
2/25/43	3,930,000	80	9,700	69	..	4.8
2/20/43	4,910,000	98	8,550	71	..	4.9
4/ 5/43	4,610,000	95	16,850	88	14	7.1
4/12/43	4,070,000	85	9,750	60	11	5.6
4/22/43	4,780,000	90	15,250	82	14	4
5/ 1/43	4,250,000	85	13,800	67	13	5.9
5/15/43	.....	..	.....	..	10	3.4
5/18/43	4,820,000	90	13,000	72	12	1.8
5/25/43	4,920,000	90	15,400	71	..	4.4
6/ 5/43	4,520,000	90	17,200	75	..	5.7
6/14/43	4,700,000	90	12,600	74	4	0

Treatment started Feb. 12, 1943 and discontinued June 10, 1943.

Drainage continued for several weeks and finally healed with scar formation.

Shortly afterward the same process recurred in the adjacent healthy skin. An abscess gradually formed, ruptured and drained, finally healing with the formation of a scar. This chain of events occurred over and over again, continuing until his last hospital admission, when he complained of diffuse involvement of the skin of the anterior half of his neck extending on to his chin and jaws.

Both admissions to the station hospital occurred because of the spontaneous rupture of an abscess such as described. In both instances the lesions healed in the pattern outlined.

In his past history he had suffered only with measles and mumps in childhood. He had complained of "stomach trouble" and "nerves" for many years. He stated that he had not had any serious illnesses, operations or injuries.

Prior to induction into the Army he worked at odd jobs. He said that he had not been engaged in any work about a farm, garden, stable or tanning factory. He also did not have the habit of chewing on straw. The patient had lived exclusively in Brooklyn since 1925.

The patient was 68 inches (173 cm.) tall and weighed 142 pounds (64 Kg.). The skin on both cheeks was involved by a disease process continuously with the skin of the anterior neck extending down roughly to the level of the larynx and laterally to the mandibular rami. The area described was altered by various sized abscesses ranging up to 3 cm. in diameter. Interspersed were multiple small sinuses which delivered a dirty yellow pus to the surface. The intervening skin appeared unhealthy, doughy and heavily scarred. The lesions were tender to palpation.

Fig. 1.—Appearance before treatment with sulfadiazine.

The diagnosis was easily established by the laboratory finding of ray fungi (Actinomyces hominis) on direct smear and culture. Two independent examinations confirmed this observation.

On admission the blood count revealed 4,610,000 red blood cells and 6,850 white blood cells per cubic millimeter. The hemoglobin was estimated to be 95 per cent. A Schilling count of 100 white cells was normal. The initial urine examined was light yellow, slightly cloudy and neutral in reaction with a specific gravity of 1.027. No sugar was present, but a faint trace of albumin was reported. On microscopy 5 to 7 red blood cells and 1 to 3 white blood cells per high power field were noted. The sedimentation rate was 23 mm. in 60 minutes.

With the diagnosis of actinomycosis established, the patient was given sulfadiazine by mouth in 1 Gm. doses every four

Fig. 2.—After treatment with sulfadiazine.

hours. About one week later the quantity was cut to 1 Gm. four times a day. This dosage was maintained for the duration of the treatment. Thus he received 500 Gm. of sulfadiazine continuously administered over one hundred and twenty consecutive days beginning Feb. 12, 1943.

It was fully two weeks before any noticeable improvement in the lesions could be observed. As a matter of fact cessation of the drug was therefore considered. However, in the ensuing weeks the lesions melted away. Not only did the abscesses disappear but the scars actually dissolved, leaving the skin practically in a normal condition.

The administration of the drug apparently had no ill effects. The patient maintained his appetite and weight. The urine, blood and sulfadiazine levels were checked at frequent intervals. The course of the blood count, sedimentation rate and sulfadiazine can be observed in the accompanying table. The highest blood sulfadiazine level was 7.1 mg. per hundred cubic centimeters. No anemia resulted, but a mild leukocytosis occurred reaching as high as 16,850 white blood cells with 82 per cent polymorphonuclear leukocytes. The urine, which contained a trace of albumin, 5 to 7 red blood cells and 1 to 3 white blood cells per high power field on admission, became entirely normal during the administration of the drug, although on several occasions the urine contained some sulfadiazine crystals.

The patient received no other medication or treatment. He was given a regular diet without benefit of iron, liver or vitamins.

COMMENT

When it was established that the patient had actinomycosis, the question arose as to what form of therapy should be instituted. Since there had occurred in the recent literature encouraging reports on the use of sulfanilamide and sulfapyri-

dine[1] in this condition, it seemed a natural sequence to use the most recent available sulfonamide, namely sulfadiazine.

While organizing the records of this case for reporting, there appeared in the literature[2] the first recorded cases of actinomycosis to be treated with sulfadiazine. This article, by Lyons and his co-workers, is based on an experience with 5 cases of actinomycosis, in all of which surgical treatment was supplemented by sulfonamide. The first patient received sulfathiazole and sulfanilamide. The others were given sulfadiazine. All were benefited by the treatment. Emphasized were the need for long continued drug therapy and the ever present danger of recurrences.

There can be little doubt that in our case sulfadiazine was the critical influence, resulting in a clinical remission of symptoms. There had been progressive involvement of the skin for over a year until sulfadiazine abruptly terminated the disease. Nevertheless we are fully aware that 1 case proves nothing. Furthermore, it is to be noted that it was the cervicofacial type of actinomycosis, which as Morton[3] indicates "is the most common and gives by far the best prognosis." The abdominal cases show a much greater mortality, and the thoracic cases have by far the poorest prognosis, the mortality approaching 100 per cent.

Another query raised is that the sulfonamides remove secondarily invading bacteria, allowing the natural defenses to combat the fungi more effectively. In our case the laboratory obtained pure cultures of the ray fungus from the discharging lesions. Nevertheless this question is still unsettled.

One other feature of this case appears worthy of mention. A moderate dose of sulfadiazine was administered daily for four months, and at no time was any untoward effect observed on the kidneys, the blood or the health in general.

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Council on Pharmacy and Chemistry

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT. AUSTIN E. SMITH, M.D., Secretary.

USE OF AMPHETAMINE SULFATE IN CONTROL OF OBESITY

Amphetamine sulfate has been accepted for inclusion in New and Nonofficial Remedies with well defined uses such as the treatment of narcolepsy and certain depressions accompanying psychopathic conditions. The Council has frequently warned against the promiscuous use of such active agents, at the same time recognizing their value.

As a result of recent articles appearing in a well known lay publication as well as in some scientific journals, the Council's office has been receiving inquiries concerning the use of amphetamine sulfate in the control of obesity. This office has been further informed that mixtures (not accepted by the Council for New and Nonofficial Remedies) containing amphetamine sulfate are being exploited for use in obtaining weight reduction. The arguments for such use of the drug were considered by the Council, and the conclusion was reached that whatever effectiveness the drug might have might possibly be due to undesirable properties. In view of the dangerous effects which might come from the exploitation of this drug for use in obesity the Council, for the information of physicians, desires to go on record as disapproving general recognition of claims for such use of amphetamine sulfate. The Council will follow closely the use of amphetamine sulfate in the treatment of obesity and will make available another statement if there should appear sufficient information to justify such action.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

ALLERGENIC PREPARATIONS (See New and Nonofficial Remedies, 1943, p. 1).

The following preparations have been accepted:

SHARP & DOHME, INC., PHILADELPHIA

Lyovac Pollen Extracts-Mulford:

The following lyovac pollen extracts-Mulford are supplied in complete treatment packages of four vacule ampul-vials containing the lyophilized extract, and four ampuls, each containing 2 cc. of sterile distilled water with 0.35 per cent phenol as preservative; also in supplementary treatment packages of one vacule ampul-vial containing the lyophilized extract, and one ampul containing 2 cc. of sterile distilled water with 0.35 per cent phenol as preservative. After restoration of the lyophilized extract to the fluid state each of the four vacule ampul-vials in the complete treatment package contains 2 cc. of pollen extract solution providing, respectively, 400, 4,000, 20,000 and 20,000 pollen units per cubic centimeter. Similarly the single vacule ampul-vial in the supplementary treatment package contains 2 cc. of pollen extract solution providing 20,000 pollen units per cubic centimeter:

Timothy Lyovac Pollen Extracts; Grass Mixture (timothy, June grass, orchard grass, sweet vernal grass and red top, 20 per cent each) Lyovac Pollen Extract; Ragweed (high ragweed and low ragweed, 50 per cent each) Lyovac Pollen Extract.

Matured pollens are thoroughly dried, separated from extraneous material and defatted by ether extraction. The defatted pollen is extracted for twenty-four hours at a temperature of 5 C. with a buffered saline solution containing dibasic sodium phosphate and acid potassium phosphate and adjusted to a *ph* of 7.4. The extracts are sterilized by candle filtration and standardized on the basis of their protein nitrogen content. When adjusted to the desired strength, the pollen extracts are filled into vacule ampul-vials and processed therein. By means of the lyophile process the freshly prepared extracts are rapidly frozen at sub-zero temperatures, dehydrated under vacuum and preserved under vacuum in the market container. The extracts are standardized on the basis of their protein nitrogen content and their potency is expressed in terms of the pollen unit, which is equivalent to 0.000003 mg. of protein nitrogen.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1943, p. 590).

The following dosage forms have been accepted:

WALKER VITAMIN PRODUCTS, INC., MOUNT VERNON, N. Y.

Solution Thiamine Hydrochloride: 15 cc. and 60 cc. bottles 100 international units vitamin B_1 per drop.

Tablets Thiamine Hydrochloride: 1 mg., 3 mg., 5 mg. and 10 mg.

ERYTHRITYL TETRANITRATE TABLETS (See New and Nonofficial Remedies, 1943, p. 306).

The following dosage form has been accepted:

BURROUGHS WELLCOME & CO., INC., NEW YORK

Tabloid Erythrityl Tetranitrate: 16 mg., 32 mg. and 65 mg.

DEHYDROCHOLIC ACID (See New and Nonofficial Remedies, 1943, p. 322).

The following dosage form has been accepted:

BURROUGHS WELLCOME & CO., INC., NEW YORK

Tabloid Dehydrocholic Acid: 0.243 Gm.

OLEOVITAMIN A (See New and Nonofficial Remedies, 1943, p. 587).

The following product has been accepted:

ABBOTT LABORATORIES, NORTH CHICAGO, ILL.

Vitamin A Capsules: Each capsule contains 25,000 U. S. P. units of vitamin A derived from natural fish liver oils.

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SATURDAY, DECEMBER 25, 1943

MEDICAL ASPECTS OF JUVENILE DELINQUENCY

The term "juvenile delinquency" is applied somewhat loosely to cover both indictable offenses and serious deviations from the moral code by boys and girls under the age of legal maturity. The broadness of this definition is evidence of the unscientific approach to this problem that frequently characterizes public discussion.

Juvenile delinquency, constantly present in modern society, is greatly exacerbated under the influence of wartime conditions. In New York City there was a downward trend from 1930 to 1940; since that time, even before our active entry into the war, a steady and disturbing rise in frequency has occurred.[1] A parallel development has appeared throughout the country. During the first twelve months of the war, for example, the number of indictable offenses increased 41 per cent in children under 14, 22 per cent in the 14 to 17 age group, 5 per cent in the 17 to 21 age group; there was an actual drop in the incidence of crime in persons above the age of 21.[2]

The medical profession is deeply concerned not only in the general effects of delinquency on society but also in the causative relationship of physical and mental disease in many instances. Furthermore, the antisocial behavior of these minors frequently leads to further medical problems, such as venereal disease and illegitimate pregnancy. There should be a sharp differentiation between the cases of delinquency that result from definite physical or mental disease or deficiency and those that occur in ostensibly normal juveniles. The latter group appears to constitute the larger proportion (possibly around 55 per cent)[3] of the cases involved; the causes here must be sought in such nonmedical factors as broken homes, adolescent restlessness, defiance of authority, high wartime pay, bad housing and lack of recreational facilities. Major responsibility for prevention of delinquency in this group rests with society in general and with educators, parents, the courts and the social services; the increase is evidence of the deficiencies of society and of these agencies in meeting the problem.

Physicians may aid in determining beforehand when possible the juvenile whose mental and physical condition shows exceptional liability toward delinquency and in separating such physical and mental invalids from normal children after the initial delinquency. A high proportion of children in this group are either definitely psychopathic or feebleminded. In others the cause may be assigned to such organic conditions as epilepsy or brain injury following infections such as encephalitis, meningitis or poliomyelitis. Even this selection, however, is not enough. As every physician knows, the treatment of these different conditions varies. The feebleminded cannot be placed with the psychopathic. Only the experienced physician, therefore, is in a position to do this sorting and to prescribe proper measures of physical and social prophylaxis.

Hysterical broadsides because of the increase in juvenile delinquency at present are unwarranted. Certainly in its medical aspects (and doubtless in its social aspects as well) the problem should be subjected to careful scientific scrutiny and analysis. The solutions proposed must rest also on sound scientific and practical grounds. Most important is identification at the earliest possible moment of those children who have mental or physical defects likely to lead to delinquent behavior; once this has been done, careful preventive measures must be undertaken so that these unfortunates may be integrated into society to the maximum of their potentialities and with the least possible harm to themselves or other persons. The medical consequences of delinquency, principally venereal disease and illegitimacy, must be recognized as symptoms of the underlying social pathology for which prevention is most important.

1. Winsor, Max: Psychology of Preadolescent Children in Wartime: V. Delinquency in Wartime, Am. J. Orthopsychiatry **13**:510 (July) 1943.

2. Pritchard, Rosemary, and Rosenzweig, Saul: The Effects of War Stress on Childhood and Youth, J. Abnormal & Social Psychology **37**: 329 (July) 1942.

3. Breguet, René: Preliminary Survey of 1,000 Case Histories of Inmates of the Elmira Reformatory, M. Times, June 1938.

ISOTOPIC STUDIES AND PROTEIN METABOLISM

In recent years many metabolic studies have been carried out with isotopically labeled amino acids. The heavy isotope of carbon, of hydrogen and of nitrogen as well as the radioactive isotope of sulfur have been useful as markers of particular amino acids. These isotopic "tags" serve, figuratively speaking, as little red lanterns that permit the tracing of their bearers in the animal body. At the same time the markers do not alter the chemical reactivity of a compound containing them, for they are isotopes of the atoms which they replace. Isotopic studies have permitted the elucidation of many obscure details of particular phases of

protein metabolism and have, moreover, forced a revision of the old concept of the rather static condition of body protein.

Investigations with marked amino acids have proved to be extremely useful in the identification of the precursors of certain physiologically active compounds. Thus, it has been demonstrated that aminoacetic acid (glycine), arginine and methionine may act as the precursors of creatine in the animal body.[1] The contribution of arginine serves to form the amidine part of the creatine molecule, and aminoacetic acid together with the methyl group of methionine serves to form the sarcosine part. These studies, which involve the labeling and the subsequent tracing in the organism of different groups in amino acids, give a definite answer to a question on the solution of which investigators have worked for decades.

Another special phase of protein metabolism to which the isotopic technic has been applied concerns the apparent conversion of administered amino acids to carbohydrate in experimental animals. This problem has long been perplexing to investigators. It was recognized that the administration of certain amino acids resulted in the deposition of an equivalent amount of glycogen in the liver of the animal. Similarly the feeding of some amino acids to an animal rendered "diabetic" by phlorhizin was known to effect the excretion in the urine of an equivalent amount of excess sugar. The heretofore unanswerable question was, however, whether the so-called glucogenic amino acids were directly converted to carbohydrate or whether they spared some metabolite (perhaps an amino acid derived from tissue protein) which subsequently was converted to carbohydrate. Long sought information has been provided by a recent study [2] in which aminoacetic acid containing heavy carbon was administered to fasted mice whose liver glycogen was subsequently analyzed for the carbon isotope. In these experiments the hepatic glycogen was found to contain only a small excess of the isotopic "tag," and the rise in liver glycogen was far more than could be accounted for by the conversion of labeled aminoacetic acid to glycogen. Indeed, only one of the "tagged" carboxyl carbon atoms of the administered aminoacetic acid was to be found for every four or five molecules of dextrose in the glycogen. Comparable results have been obtained in experiments with phlorhizinized animals, the extra dextrose excreted in the urine after administration of "tagged" alanine being found to contain little excess isotope.[3] The experimental data from the studies here mentioned indicate that the bulk of formed carbohydrate originated not by direct conversion of the administered amino acid but rather by the conversion of some metabolite which was in some way spared by the administered compound.

There are many other problems relating to the metabolism of protein and amino acids that have been profitably studied with the aid of isotopically marked amino acids. Perhaps the most striking contribution of these investigations is the definite proof which they afford of the dynamic state of body protein.[4] The classic theory of the more or less static state of body protein—protein synthesis in the adult animal being restricted largely to replacing losses due to the "wear and tear" of metabolism—is no longer tenable. In experiments in which the fate in the organism of orally administered "tagged" amino acids was studied the late Dr. Schoenheimer and his colleagues observed that some of the nitrogen of the administered substances was transferred in vivo and could be subsequently identified in the different amino acids of the body proteins.

Moreover, a considerable amount of an administered amino acid was found to be rapidly incorporated as such by tissue protein. Data obtained by Schoenheimer and his co-workers in this connection indicate that there is a continual opening and closing of the peptide linkages. Most tissue proteins are apparently constantly undergoing synthesis and degradation, as envisioned some years ago by Borsook and Keighley.[5] In the liver, for example, more than half of the protein seemingly may be broken down and resynthesized in ten days,[6] a truly remarkable phenomenon. Schoenheimer [4] has pointed out that in life the degradative reactions are balanced by synthetic reactions. The regenerative processes involving an increase in free energy must, in general, be coupled with another reaction such as that of oxidation. After death, when the oxidative systems fail, syntheses cease and the unbalanced degradative processes lead to collapse of structural protein elements.

One can expect more contributions to our knowledge of the metabolism of proteins as well as of lipids, of carbohydrates and of minerals as more investigators become familiar with the technic of isotopic studies and as the required experimental apparatus becomes more generally available. Isotopically labeled compounds are almost indispensable for the study of some phases of metabolism. The employment of these comparatively new research tools in attacks on many important problems will without doubt continue to be rigorously prosecuted.

1. Bloch, Konrad, and Schoenheimer, Rudolf: The Biological Precursors of Creatine, J. Biol. Chem. **138**: 167 (March) 1941. du Vigneaud, Vincent; Chandler, J. P.; Cohn, Mildred, and Brown, G. B.: The Transfer of the Methyl Group from Methionine to Choline and Creatine, ibid. **134**: 787 (July) 1940.

2. Olsen, N. S.; Hemingway, Allan, and Nier, A. O.: The Metabolism of Glycine: I. Studies with the Stable Isotope of Carbon, J. Biol. Chem. **148**: 611 (June) 1943.

3. Gurin, Samuel, and Wilson, D. W.: The Intermediary Metabolism of Alanine C,[13] Federation Proceedings **1**: 114 (March) 1942.

4. Schoenheimer, Rudolf: The Dynamic State of Body Constituents, Harvard University Press, Cambridge, Mass., 1942.

5. Borsook, Henry, and Keighley, G. L.: The "Continuing" Metabolism of Nitrogen in Animals, Proc. Roy. Soc. London, series B **118**: 488 (Nov. 1) 1935.

6. Compare Borsook, Henry, and Dubnoff, J. W.: The Metabolism of Proteins and Amino Acids, Ann. Rev. Biochem. **12**: 183, 1943.

EMERGENCY MATERNITY AND INFANT CARE FOR DEPENDENTS OF SERVICE MEN

In the Organization Section in this issue of THE JOURNAL, page 1125, appears a statement prepared by the Children's Bureau of the Department of Labor describing a Conference on Emergency Maternity and Infant Care called by the Bureau at Washington, D. C., December 10 and 11. This conference was assembled in response to a resolution by the American Academy of Pediatrics [1] calling for a conference in which representatives of the medical profession, the hospitals and the service men would meet with the Children's Bureau to discuss the program. The recognition of such official representatives of leading medical organizations is a new principle for this government agency.

The chief issue raised by the medical representatives was whether the program should be a service program with payment by the government direct to physicians and hospitals rendering service or whether, as called for by the House of Delegates of the American Medical Association,[2] it should be a program of cash allotments to wives of service men permitting them to make their own arrangements for care for themselves and their infants. The cash allotment plan was opposed by the representatives of the War Department Dependency Board, the Navy Bureau of Personnel, the Navy Relief Society, the Army Emergency Relief and others on the ground that the wives of service men are in many instances young and inexperienced and would be incapable of managing medical care and hospitalization for themselves. The Children's Bureau took the position that the matter was settled for them by an opinion that it was the intent of the Congress that the Bureau shall administer a service program and not one of cash allotment.

After they had presented the action of the House of Delegates of the American Medical Association to the conference—previously presented to the Children's Bureau at meetings of the Advisory Committee—and had been overruled, the representatives of the American Medical Association stated to the conference that they would continue to participate in the deliberations in a spirit of cooperation. This was in accord with the action of the House of Delegates as expressed in the first paragraph of its resolution [2] in which purposes and objectives of the program were introduced on behalf of the medical profession.

The chief of the Children's Bureau stated that this program was never presented as anything but an emergency program and "in the future when the people of the United States again have more leisure to consider domestic policies all of those in this room and everybody else concerned will certainly have full liberty to review the experience under this program and under any other program and draw such conclusions as they see fit." Physicians, who have clearly stated their opposition to federalization of medicine and other bureaucratic developments, will, of course, see that the wives and infants of men in the armed services receive the medical care which they require, under the EMIC program or otherwise.

1. American Academy of Pediatrics, Board of Governors, unpublished report.
2. American Medical Association, House of Delegates, Report of Reference Committee on Legislation and Public Relations, J. A. M. A. 122: 621 (June 26) 1943.

Current Comment

PATULIN FOR THE COMMON COLD

Recent reports from London [1] describe work with a preparation called "patulin" for the common cold. This substance is a metabolic product of penicillium patulum and has now been identified as anhydro-3-hydroxymethylene-tetrahydro-γ-pyrone-2-carboxylic acid. After an extensive description of the chemistry of this substance, clinical experiences with it in cases of the common cold are reported by Gye and by Hopkins. Nearly 100 patients and 85 controls were involved. One of the patients showing dramatic improvement was Gye himself. A high proportion of the persons treated seemed to show recovery in a much more rapid and complete fashion than would have been expected without treatment. From this small sample the statistician Major Greenwood deduced that the results in the treated group would have been most unlikely to occur from pure chance alone. In the *Lancet* a week after publication of these reports appeared a communication from three investigators,[2] headed by Stuart-Harris, which briefly records the results of giving patulin to 100 patients with the common cold and of not treating 100 alternate persons. The proportion of cases which showed clinical improvement was substantially the same in the two groups; the writers conclude that patulin had no demonstrable effect on the course of this series of colds as compared with the natural evolution of the disease. Pending the outcome of further studies, it would be unwise to view this new form of treatment of colds with too much optimism.

SIXTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

The sixth Annual Congress on Industrial Health will take place on Feb. 15 and 16, 1944 at the Palmer House in Chicago. Those who expect to attend are urged to make travel and hotel reservations at their earliest convenience. These sessions follow directly after those of the Annual Congress on Medical Education and Licensure. The deans of medical schools and others interested in medical education may find it possible to attend the sessions on industrial health; a special effort will be made to induce them to do so. Official representatives of medical societies and allied organizations can attend both congresses this year without extra travel. One of the great obstacles to the growth

1. Raistrick, Harold: Patulin in the Common Cold: Collaborative Research on a Derivative of Penicillium Patulum Bainier, Lancet 2: 625 (Nov. 20) 1943.
2. Stuart-Harris, C. H.; Francis, A. E., and Stansfeld, J. M.: Patulin in the Common Cold, Lancet 2: 684 (Nov. 27) 1943.

of industrial medical service has been the slow development of public interest in the health and economic benefits which the physician can bring to the industrial organization. The Congress on Industrial Health, therefore, will attempt to attract greater interest from management and labor. Prominent representatives of these groups will be asked to participate. Interest in the physical welfare of the working population must be maintained even after the stimulus of wartime production is over. This element in postwar planning must be encouraged. The sessions of the sixth Annual Congress on Industrial Health will attempt to bring this relationship into proper focus. The congress will also emphasize the importance of physical restoration, retraining and reemployment of the disabled, an issue which is certain to be a source of medical preoccupation for some years to come. Industrial health is gradually assuming greater and greater importance as an avenue for the distribution of medical service. Every physician and medical organization should recognize the trend so that the movement may be guided along dependable scientific and educational lines.

ATHEROSCLEROSIS: A PRIMARY DISEASE OF THE INTIMA

Hirsch and Weinhouse [1] summarize an instructive review of the present knowledge of the role of lipids in human atherosclerosis with the statement that the chemical, physical and morphologic processes in the aging of arteries seems to be independent of atherosclerosis, which is "primarily a disease of the intima" consequent to lipid deposits. The chemical identity of the simple lipids in the atherosclerotic intima, in the blood plasma and in the normal intima is cited as substantial evidence in support of the conclusion that in human atherosclerosis plasma lipids are deposited in the intima and give rise to grave structural changes. In the rabbit [2] and in the chick [3] atherosclerosis can be produced by experimental hyperlipemia, but in the human adult atherosclerosis may develop without obvious quantitative or qualitative abnormalities in the blood lipids; hence Hirsch and Weinhouse postulate that here deposition of lipids in the intima is dependent on local factors the nature of which is not yet understood. According to their view phagocytosis does not play an important part in the intimal deposition of lipids in human atherosclerosis. "The evolution of the lesions from the simple fatty deposits to calcified atheromatous ulcers occurs because of several processes, among which are phagocytosis, physical and chemical effects on the tissues by the lipids or their decomposition products, disturbances in the nutrition of the tissues, admixture of blood, and reactions of the tissues against the lipids deposited." Such, in brief, is the conception of human atherosclerosis presented by Hirsch and Weinhouse on the basis of their review of the role of intimal deposits of lipids in this disease. The old view that atherosclerosis is the result of primary lesions in the media followed by secondary changes in the intima is reversed and lipid deposition in the intima put forward as the primary lesion. The old view became more or less invalidated by the production of experimental atherosclerosis by hyperlipemia, but the new view does not assume that hyperlipemia is a necessary factor in adult human atherosclerosis, although it, of course, may favor its development. The new view has heuristic value in that it will lead to studies of "the interactions and interconversions of the lipids in the blood and tissues" and to renewed study of the applicability of the results of experiments on the production of atherosclerosis in animals to the human disease.

1. Hirsch, S. F., and Weinhouse, Sidney: The Role of the Lipids in Atherosclerosis, Physiol. Rev. **23**: 185 (July) 1943.
2. Leary, Timothy: The Genesis of Atherosclerosis, Arch. Path. **32**: 507 (Oct.) 1941.
3. Dauber, D. V., and Katz, L. N.: Experimental Cholesterol Atherosclerosis in an Omnivorous Animal, the Chick, Arch. Path. **34**: 937 (Dec.) 1942.

LIBERTY SHIP NAMED FOR SIR FREDERICK BANTING

On December 20 the U. S. Merchant Marine Liberty Ship *Sir Frederick Banting* was launched at the Bethlehem Fairfield Shipyard in Baltimore. Banting, who died in an airplane crash in 1941, was internationally known for his medical research, especially for his studies on diabetes. The naming of this ship can be interpreted as an expression of gratitude and appreciation to Banting as well as a tribute to Canada, his native land. The launching was attended by President H. J. Cody of the University of Toronto, by Dr. C. H. Best, by the Canadian ambassador, Laughton McCarthy, by two additional members of the University of Toronto faculty and by several prominent physicians from the United States. In the absence of Dr. James R. Paullin, President of the AMERICAN MEDICAL ASSOCIATION, a short speech of dedication was given by Dr. J. R. Williams of Rochester, N. Y. Lady Beatrice, Dr. Banting's widow, christened the ship. The medical profession of the United States will join in the acclaim of this richly deserved honor.

CONGRESS PROVIDES FUNDS FOR RELOCATION OF CIVILIAN PHYSICIANS

Congressional action has been completed on a supplemental appropriation bill, H. R. 3598, which authorizes $200,000 for use by the United States Public Health Service in providing, at the request of local communities, medical and dental services in critical areas. Such services will be provided through the medium of contracts with civilian physicians and dentists who agree to practice for not less than one year in the new locality. A monthly allowance of $250, it is contemplated, will be paid the physician or dentist for three months plus moving expenses. The local community requesting such services will be required to assume 25 per cent of the relocation allowance and moving expenses, and the relocated physician or dentist must comply with the licensure laws of the state to which he removes. This bill has now been submitted to the President. The President had initially requested $1,000,000 to supply these services. The proposal that the Public Health Service be authorized to assign medical officers to critical areas failed to receive congressional sanction.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

NEARLY FIVE HUNDRED MEDICAL AND DENTAL OFFICERS GIVEN COURSE AT THE UNIVERSITY OF PENNSYLVANIA

During the past year the University of Pennsylvania, Philadelphia, has given a series of thirty-two courses to nearly five hundred medical and dental officers of the Army, at the request of the Surgeon General of the United States Army. The courses were offered under the administrative supervision of the Graduate School of Medicine of the university, of which Dr. Robin C. Buerki is dean.

In order to conduct these courses a group of 124 faculty members was formed from Hahnemann Medical College, Jefferson Medical College, the School of Medicine of Temple University and the Graduate School of Medicine, the School of Medicine and the Evans Dental Institute of the University of Pennsylvania. To this group were added the surgeons of the hospitals of these medical schools, as well as the Lankenau, Methodist, Oncologic, Pennsylvania, Philadelphia General, Presbyterian and Samaritan Hospitals, and the Evans Dental Institute.

The fundamentals of basic surgery, surgery of the extremities and of the thorax, plastic and maxillofacial surgery, together with anesthesiology, bacteriology and clinical pathology were covered in the courses. Most were of six weeks' duration, but twelve weeks was devoted to anesthesiology and clinical pathology. All officers spent their first two weeks in the study of basic and fundamental surgery and the last four weeks in one of the special fields to which they had been assigned by the Surgeon General.

PROMOTIONS FOR ARMY NURSES

Increased grades have been allotted to positions now held by members of the Army Nurse Corps, which will permit promotions for about one third of the approximately 33,000 members of the corps. Recommendations for promotions will be made by chief nurses and commanding officers. Authorization for the promotions is effective immediately. Formerly, in a hospital unit which required one hundred nurses only one captain and seven first lieutenants were authorized. The new plan will authorize a lieutenant colonel, a major, three captains and thirty-one first lieutenants for the same organization. The position held by a nurse in charge of a hospital with a minimum capacity of 3,000 beds will be such as to carry the relative rank of lieutenant colonel, at a hospital of 750 bed capacity the relative rank of major, and that of 500 beds but less than 750 the relative rank of captain. Regardless of capacity of the hospital, the nurse in charge will have the relative rank of lieutenant colonel if the hospital has enrolled, in addition to the authorized nurse strength, twenty-five or more nurses studying in one or more specified courses. Directors of the Army Nurse Corps in major theaters of operations will have the relative rank of lieutenant colonel, in minor theaters of operations and defense commands the relative rank of major. The designation of a theater as major or minor allotment of nurses is made on the basis of its medical requirements. The relative rank of captain for dietitians and physical therapy aides in charge of departments in 3,000 bed hospitals or in hospitals conducting courses for students is covered by the authorization.

ELEVENTH CLASS OF AVIATION PHYSIOLOGISTS

Graduation exercises at the School of Aviation Medicine, Randolph Field, Texas, for the eleventh class of Aviation Physiologists was held on October 16. Brig. Gen. Eugen G. Reinartz, U. S. Army, is commandant of the school. The course in aviation physiology is of five weeks' duration. Among those graduating were the following officers of the medical corps:

Capt. Carroll L. Conley, Baltimore.
1st Lieut. John W. Bricker, Cleveland.
1st Lieut. Bernard Gomberg, Chicago.
1st Lieut. Oscar D. Ratnoff, Boston.
1st Lieut. Jack C. Shrader, Indianapolis.
1st Lieut. Oscar Sugar, Chicago.

In addition there was one graduate of the Medical Corps of the Argentine army, 1st Lieut. Raul Marty, Buenos Aires, Argentina.

LIEUT. ROY F. DENT JR. AWARDED LEGION OF MERIT

Lieut. Roy F. Dent Jr. was awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding services in North Africa during the period Dec. 26, 1942 to May 7, 1943. In addition to performing his normal assigned duties in a superior manner, Lieutenant Dent assembled and installed all of the x-ray equipment in his hospital and adapted this equipment to operate on electric current available locally. Later he adapted, adjusted and corrected the installation of all equipment within the Mediterranean base section. Thus he made possible the use of valuable and much needed equipment which otherwise would have remained idle. Also Lieutenant Dent by his ingenuity and technical skill improvised helpful mechanical equipment and kept in repair and operation many items of electrical equipment which have been of material assistance in the operation of the hospital. By his resourcefulness, technical knowledge and untiring efforts he has greatly facilitated and expedited treatment and recovery of the sick and wounded." Dr. Dent graduated from Northwestern University School of Medicine, Chicago, in 1942 and entered the service in March 1942.

RIGID TRAINING TO PREPARE NURSES FOR DUTY IN COMBAT AREAS

The War Department announced recently that the four week basic training courses for nurses after their entry into the Army Nurse Corps will include digging foxholes, marching with full packs and learning the approved Army technic for crawling over battle terrain. Col. Florence Blanchfield, superintendent of the Army Nurse Corps, in emphasizing the importance of the basic training program of the corps, said that "army nurses must know not only how to care for others but also how to take care of themselves." The course is designed to orient the newly commissioned army nurse and to give a general background of information concerning the Army and its organization, and in particular the organization and function of the Medical Department and the Army Nurse Corps. Self protection from enemy shelling and bombardment is essential, particularly to the army nurse serving overseas near front lines

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or in the rear or evacuation areas. Teaching self protection, however, is not the only purpose of the basic training. Newly commissioned nurses are taught the principles and methods of medical field service and army nursing in order that they may perform efficiently those duties to which they may be assigned.

The basic training program given at nurse training centers in each of the Army's nine service commands in the United States includes training in individual defense against chemical attack and against air, parachute and mechanized attack. The army nurse learns how to use a gas mask, how to dig a foxhole quickly, how to conceal herself by camouflage and how to advance under a barrage of enemy shell fire. Instruction also includes training in sanitation and control of disease, fly and mosquito control, food inspection and mess sanitation, field water supplies and purification, waste disposal, first aid, care and management of mental patients, treatment of chemical casualties and other medical phases of army life.

PRISONERS OF THE JAPANESE

Capt. Leo Schneider of Portland, Ore., recently sent word to his wife saying that he was uninjured and in good health and has been a prisoner of the Japanese since the fall of the Philippines. Captain Schneider graduated from the University of Oregon Medical School in 1935 and entered the service in January 1941.

Capt. John A. Marsico, formerly of Lorain, Ohio, recently sent word to his wife that he was captured by the Japanese on May 7, 1942 and is now interned at Osaka as a doctor in a Japanese prison camp. Dr. Marsico graduated from the Ohio State University College of Medicine, Columbus, in 1930 and entered the service on Aug. 1, 1940.

Word has recently been received that Major John W. Raulston, who was stationed at Fort Stotsenburg, Philippine Islands, just prior to the war, has been missing since the fall of Bataan and is a prisoner of war by the Japanese. Dr. Raulston graduated from the University of Tennessee College of Medicine, Memphis, in 1930. He has been in the service since July 1, 1936, at which time he was commissioned a first lieutenant in the regular army of the United States.

ARMY PERSONALS

According to the *Army and Navy Journal* of September 25, command headquarters at Randolph Field, Texas, has announced the appointment of Col. Ernest F. Harrison, M. C., as surgeon for the A. A. F. Central Flying Training Command at Randolph Field.

Dr. Margaret M. Ross of Rumford, R. I., was the first woman doctor in Rhode Island to join the armed forces. She was sworn in as a captain in the U. S. Medical Corps in October and subsequently assigned to the Post Hospital at Fort Des Moines, Iowa, and is now eligible for duty on any war front. Dr. Ross graduated from Tufts College Medical School, Boston, in 1922.

NAVY

TUBERCULOSIS SURVEY

The Bureau of Medicine and Surgery, Washington, D. C., announced on November 29 that the Navy has now adopted a new rapid and reliable method of giving x-ray examinations to all recruits for the purpose of discovering and weeding out those with tuberculous symptoms. Under the new system of photofluorographs using 35 mm. motion picture film an average of 240 pictures an hour can be made at a cost of 1 cent per person. When a tuberculous condition is suspected, the person is recalled for further diagnostic examination, including a standard 14 by 17 inch x-ray film. This new method of screening persons permits speedy examinations with a low rate of error. As many as 3,200 cases have been done in one day and 41,989 examinations a month.

As a result of the facts demonstrated by this survey, as well as the Navy's general experience with the 35 mm. fluorograph for chest films, it is felt that this system is inexpensive, reliable and accurate for the purpose of mass tuberculosis checks. Use of the miniature negatives reduces the necessary filing space for health records to a hundred and twenty-fifth that required under old methods, it lessens the chance that tuberculosis will spread within the naval service, it provides a proved method by which similar inexpensive preventive surveys can be made among the civilian population and it gives patients with tuberculosis a chance to overcome the disease by discovering its presence in the early stages. Work is still needed to perfect the photofluorographic process so that the size of the image will be increased without increasing the size of the film frame.

REAR ADMIRAL LUTHER SHELDON JR. OBSERVES MEDICAL FACILITIES

Rear Admiral Luther Sheldon Jr., assistant chief of the Bureau of Medicine and Surgery, recently returned to Washington after a four months tour of observation of medical facilities in the United Kingdom, North Africa, Sicily, West Africa, Brazil and the West Indies. Dr. Sheldon said he was satisfied with the adequacy and function of the medical installations which he visited and that he was greatly impressed by the high morale existing in the naval medical personnel, almost all of whom expressed a desire to remain at their posts until the job is finished. Existing medical facilities, and those which are now in the process of completion, will be entirely adequate to meet any contingency, he said.

LIEUT. COMDR. SAMUEL A. ISQUITH AWARDED LEGION OF MERIT

The Legion of Merit was awarded to Lieut. Comdr. Samuel A. Isquith, formerly of Brooklyn, for outstanding services as a medical officer aboard the heavy cruiser *Vincennes*, sunk in an engagement with Japanese forces in the Solomons area in August 1942. The award was accompanied by a letter from Frank Knox, Secretary of the Navy, which said in part that Dr. Isquith, "surmounting all the obstacles presented by battle conditions, tirelessly devoted himself to providing the injured with skilled medical care, remaining at his dressing station until the sinking ship had been almost completely abandoned. Without respite from his exhausting task he continued administering to the wounded on a life raft in the open sea, aboard a rescuing destroyer and later on a transport, until ordered to rest by his commanding officer." Dr. Isquith graduated from the Long Island College of Medicine, Brooklyn, in 1921, and entered the service in February 1942.

RETIRED PHYSICIAN NOW TESTS GYRO COMPASSES

A retired physician, who served as a major in the Army Medical Corps in World War I, is now taking the pulses and reading the clinical charts of delicate direction-finding machines for the Navy. He is Dr. James V. W. Boyd of Springfield, Mass., who retired from medical practice ten years ago. Employed at the Packing Machine Company, which manufactures gyro compasses, Dr. Boyd takes the vital readings as gyro compasses are put through their final tests. Dr. Boyd graduated from Columbia University College of Physicians and Surgeons, New York, in 1894.

SECTION OF SANITARY ENGINEERING

The Bureau of Medicine and Surgery, Washington, D. C., recently announced that a Sanitary Engineering Section has been authorized in the Division of Preventive Medicine. The functions of this new section shall be to advise on the design, construction, operation and maintenance of water supplies, water treatment plants, sewerage systems, sewage treatment plants, general waste disposal and collateral facilities, as well as the engineering phases of insect and rodent control. These functions are to be performed from the perspective of preventive medicine and public health.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their Procurement and Assignment Service quotas for Jan. 1, 1944 or later:

(Continuation of list in THE JOURNAL, December 18, p. 1055)

CONNECTICUT

Hartford Municipal Hospitals, Hartford. Capacity, 349; admissions, 4,153. Mr. William J. Ryan, Superintendent (3 interns).

INDIANA

Indiana University Medical Center, Indianapolis. Capacity, 643; admissions, 9,706. Mr. J. B. Howe Martin, Administrator (5 assistant residents, 1 resident—obstetrics, orthopedics, pathology, cardiology).

KANSAS

University of Kansas Hospitals, Kansas City. Capacity, 350; admissions, 6,599. Dr. J. Harvey Jennett, Medical Director (resident—radiology, 4-F applicant, March).

MARYLAND

Mercy Hospital, Baltimore. Capacity, 338; admissions, 7,569. Sister M. Celeste, Superintendent (2 interns, 1 resident).

MISSOURI

St. Louis City Hospital, St. Louis. Capacity, 1,127; admissions, 15,013. Dr. Leo J. Wade, Medical Director (resident—pathology).

NEW JERSEY

Newark Memorial Hospital, Newark. Capacity, 165; admissions, 2,896. Miss Catherine Guenther, R.N., Superintendent (2 interns, 1 resident—mixed).

Saint Joseph Hospital, Paterson. Capacity, 468; admissions, 9,773. Sister Anna Rita, R.N., Superintendent (8 interns).

NEW YORK

State Institute for the Study of Malignant Diseases, Buffalo. Capacity, 107; admissions, 2,063. Dr. Burton T. Simpson, Medical Director (resident—malignant diseases).

Sydenham Hospital, New York. Capacity, 205; admissions, 4,260. Mr. Emil Greenberg, Executive Director (2 vacancies).

New York Hospital—Westchester Division, White Plains. Capacity, 350; admissions, 361. Dr. Clarence O. Cheney, Medical Director (3 residents—psychiatry).

PENNSYLVANIA

Mercy Hospital, Altoona. Capacity, 180; admissions, 3,867. Mother Mary Otillia, Superintendent (3 interns).

VIRGINIA

Hospital of St. Vincent de Paul, Norfolk. Capacity, 250; admissions, 8,271. Sister Inez, R.N., Superintendent (3 interns).

WASHINGTON

King County Hospital, Unit No. 1 (Harborview), Seattle. Capacity, 505; admissions, 12,659. Dr. W. W. Schwabland, Acting Medical Superintendent (assistant resident).

WISCONSIN

Wisconsin State Sanatorium, Statesan. Capacity, 241; admissions, 131. Dr. Richard H. Schmidt Jr., Medical Superintendent (resident—tuberculosis).

MISCELLANEOUS

PUBLIC HEALTH UNDER HITLER

According to *Le Petit Marseillais* of September 14 the quota of insulin for the month of September has been reduced by three fifths as compared with that for the month of August.

The Chief Public Health Directorate has ordered the inoculation against typhus of all persons engaged in the struggle against this disease, according to *Zora* of September 19. The entire people will not be inoculated against typhus because it is very hard to obtain serum. The directorate, has, however, ordered a delousing campaign in all regions threatened by the disease before the winter sets in.

According to *Dagens Nyheter* of October 10 the Germans have demanded at least 200 Norwegian nurses for hospital service in Germany or other occupied territories. In some cases they have promised to consider the request of the nurses to serve in Germany itself. It is supposed that the increased air offensive against Germany has caused this demand.

According to DNB of October 12, during the past few days the reich leader of pharmacists, SA-Gruppenfuehrer Schmierer, was able to celebrate his tenth anniversary as leader of the German pharmacists' profession. During this important period he was able to merge German pharmacists into a firm and uniform professional community, to tackle a great many questions of the profession with exemplary energy, to solve them and to give the members of his profession a thorough knowledge of the wealth of ideas of national socialism. It is chiefly due to him and to the devotion of all those who have a part to play in the supply of medicaments that the civilian population is still able, in the fifth year of the war, to obtain the medicinal products it requires.

Currentul of October 3 states that the Ministry of Labor, Health and Social Services has been authorized to send the pathologist Dr. Al. (?Birule) as delegate to the International Medical Commission of Inquiry appointed to investigate the murders committed at Vinitsa in the Ukraine.

NPD, October 20, reported that, besides the hospitals for foreign workers in the reich which are attended by camp doctors, sick bays are now being established where foreigners who are billeted in private homes are taken care of. On the whole, foreign doctors and dentists and women assistants give treatment to their compatriots. Specialists are consulted in cases of serious illness.

DPT, Stockholm, October 19, stated that the Germans apparently intend to make Denmark a convalescent home for homeless Germans from the industrial districts. An extensive immigration of German civilians is therefore expected during the coming winter. The Germans have already bought large villas and other buildings which have been converted into homes for German women and children, but of late they have simply been requisitioning a great number of Danish schools and premises for German soldiers or German families who have been rendered homeless by bombing. Several Danish factories have already received orders from such places. As Danish blanket firms have been ordered to deliver blankets, a blanket factory at Odense was seriously damaged recently by sabotage. Several timber firms, for instance one large firm at Naestved, and the contractors Nicolaison and Nielsen at Copenhagen south harbor, have been ordered to supply wooden barracks from the beginning of September. Homeless evacuated Germans are supplied with furniture which has been confiscated from Jews who have been arrested.

According to the October 12 (Vienna edition) of the *Völkischer Beobachter* in opening the discussion meeting of the German Society for Internal Medicine the reich health leader, Conti, said that Germany was free from epidemics in this war as never before. Not only was this due to preventive measures but it is also the fruit of the work of our scientists, practitioners and all doctors. Even the attacks of the Anglo-American terror bombers on German towns have not increased the danger of epidemics. We can fortunately state this despite the activity of enemy propaganda, which asserts that typhoid and cholera have appeared in Hamburg. The standard of health of the German people in the fifth year of war is even better than during the autumn of 1942.

ORGANIZATION SECTION

OFFICIAL NOTES

THE 1944 CHICAGO SESSION

The Scientific Exhibit

The Committee on Scientific Exhibit of the Board of Trustees has authorized three special exhibits, which will be presented under the guidance of special exhibit committees.

The special exhibit on fractures will be continued as in former years, showing how to make and store plaster of paris bandages, fractures of the lower end of the radius, fractures of the ankle and emergency treatment of fractures for transportation. The committee consists of Dr. Kellogg Speed, Chicago, chairman; Dr. Frank D. Dickson, Kansas City, and Dr. Walter E. Lee, Philadelphia.

The special exhibit on burns will include both industrial and military phases of the problem. The committee is composed of Dr. Stanley J. Seeger, Texarkana, chairman; Capt. Ernest W. Brown, Bureau of Medicine and Surgery, United States Navy, and Capt. Joseph E. Hamilton, Walter Reed General Hospital, United States Army.

The special exhibit on anti-infective agents will include penicillin, sulfonamides and other new anti-infective drugs. Dr. Chester S. Keefer, Boston, and Dr. Austin E. Smith, Chicago, will be in charge of the exhibit.

The sixteen sections of the Scientific Assembly will arrange groups of exhibits as usual. Applications for space should be made to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago 10.

DR. F. H. ARESTAD APPOINTED ASSISTANT SECRETARY OF COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The Council on Medical Education and Hospitals announces that Dr. Fritjof H. Arestad has been appointed to the position of Assistant Secretary.

Dr. Arestad, who has been on the Council staff for thirteen years, will be concerned mainly with all hospital activities of the Council including the registry of hospitals, formerly under the direction of Mr. Homer F. Sanger, as well as with internships, residencies and fellowships.

CONFERENCE ON EMERGENCY MATERNITY AND INFANT WELFARE

The Children's Bureau of the United States Department of Labor, in response to a resolution adopted by the Executive Board of the American Academy of Pediatrics, called a conference on the emergency maternity and infant care program for the wives and infants of enlisted men in the armed forces in Washington on Dec. 10 and 11, 1943. The resolution of the Academy of Pediatrics proposed a conference of official representatives of the service men together with official representatives of the professions actually rendering the service. There were present representatives designated by the American Medical Association, American Hospital Association, U. S. Public Health Service, American Association of Obstetricians, Gynecologists and Abdominal Surgeons, American Academy of Pediatrics, American Gynecological Society, American Pediatric Society, Committee of Physicians for the Improvement of Medical Care, Association of State and Territorial Health Officers, War Department, Navy Department, Army Emergency Relief, Navy Relief Society, American Red Cross, American Legion and the Washington representatives of five national women's organizations that have supported the legislation. The Children's Bureau also invited the medical and public health members of the Children's Bureau Advisory Committee on Maternal and Child Health Services. Dr. Martha M. Eliot, associate chief of the Children's Bureau, served as chairman of the conference.

The first day of the conference was given over to a full discussion by the official delegates of the various organizations of the purpose of the emergency maternity and infant care program as provided for in the acts of Congress and the policies under which the program is being administered by the Children's Bureau.

Miss Lenroot, in response to inquiries as to whether the Children's Bureau regarded the program as an emergency program or one that would be continued after the war, stated that since the appropriations made by the Congress for emergency maternity and infant care were national defense items the Secretary of Labor in her regulations governing allotments of these funds had specified that "the term 'emergency' refers to the period of the present war and six months following its termination." Miss Lenroot stated further that ". . . this program has never been presented to Congress, to the Bureau of the Budget, or to any one else by the officials of the Children's Bureau as anything but an emergency program, 'emergency' meaning the usual definition of the war period and six months following the termination of the war."

In addition, Miss Lenroot stated: "The Children's Bureau for many years has been concerned, as you know, with the extension and improvement of services for mothers and children. In that effort we have had a very wide degree of cooperation from the medical profession, partly through the activity that has been developed through the Children's Bureau and the State health agencies and partly through the other forces that have been set in motion over a long period of years. There has been a remarkable reduction in maternal mortality and a very fine reduction in infant mortality. The Children's Bureau was not satisfied with the status quo before the war. We could not be satisfied while approximately 10 per cent of the mothers in this country were delivered by untrained practitioners and while accepted standards of maternity care and infant care were by no means generally applied. Therefore, of course, we are concerned about how we may go forward in the period following the war in efforts to improve the status of maternal and child health in this country."

"However," Miss Lenroot said, "I want to make it clear that this emergency maternity and infant care program was developed in response to need and was in no way a part of any master plan or strategy. It was developed very simply as a measure to meet war need as a result of the experience in the State of Washington and other places and of the evidence of need that was coming to us.

"In the future, when the people of the United States again have more leisure to consider domestic policies, all of us in this room and everbody else concerned will certainly have full liberty to review the experience under this program and under any other program and draw such conclusions as they see fit. Those conclusions will differ, for people of all shades of opinion as to public responsibility for medical care will be cooperating in the program. All will have the privilege of reviewing what happened under this program. All of us will have the privilege of free citizens in the United States to form whatever judgments as to the future may seem wise."

The question as to whether the program should be changed from one of payments for medical, hospital and nursing care to one of cash grants to the wives of enlisted men was discussed

fully by representatives of the medical profession and by representatives of the Army, the Navy and the various organizations concerned with dependents of service men. The position of the American Medical Association as being in favor of cash grants was stated by its official representatives. The present policy of Congress in providing for medical, hospital and nursing care instead of cash grants was supported in discussion by the representatives of the service men and by various organizations concerned with the welfare of the wives and infants of the enlisted men and by some of the medical and public health members of the conference. Since the Children's Bureau has no jurisdiction in this matter but must administer the program in accordance with the act of Congress and provide care rather than cash grants, the issue was not acted upon by the conference.

On the second day, therefore, attention was turned to the policies adopted by the Children's Bureau in the administration of the program. A detailed statement of proposed policies was presented to the conference for discussion. The conference made many recommendations which the officials of the Children's Bureau stated would be given full consideration in the revisions now being made of these policies. After full discussion of the question as to whether physicians should be permitted to charge fees in addition to payments made by the state health agencies for services rendered under the program, the conference agreed without dissent that "supplementary payment to the physician by the patient for services authorized should not be allowed."

It will be of interest to physicians that the conference also concurred in the following policies relating to administration of the program.

The hospital, if hospital care is requested, agrees to accept payment only from the state health agency for services rendered under the program and will provide at least ten days care following delivery if accommodations are available and the patient wishes to remain in the hospital.

The hospital will provide special accommodations or services as indicated by the patient's medical condition in return for the per diem payment made by the state health agency.

The wife of an enlisted man may have free choice under the program of all types of available facilities and services including private practitioners, clinics, hospitals and other health facilities that meet the standards established under a state plan for each type of service or facility.

The cost of medical services in a clinic and/or hospital, including maintenance and salaries, where such medical service is provided by staff physicians (such as interns, resident staff and attending physicians employed by or appointed to the staff of clinic or hospital) must be included in the calculation of the cost per clinic visit and the "ward-cost-per-patient-day" (as outlined by the Children's Bureau in the memorandum of Sept. 1, 1943).

Individuals accepted for care under the program will be routinely referred to local public health agencies for the provision of whatever public health nursing services can be made available.

Arrangements will be made to utilize community facilities including appropriate social and health agencies to meet needs other than those provided for under the emergency maternity and infant care program for wives and infants of enlisted men.

There was also discussion with respect to methods of payment and the scope of the service included under the plan. The discussion brought out that it is the intent of Congress that there shall be no financial investigations for eligibility for care under the program. The program provides for complete maternity care and for the consultation of specialists and other special services in accordance with the medical need of the wife or infant.

The revised policies will be distributed to the state health agencies and published in full in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

At the close of the meeting the following resolution offered by a representative of the Academy of Pediatrics was adopted:

WHEREAS, The free expression of opinion during this conference from official representatives of all interested agencies has been of the greatest value in securing a better understanding and cooperation of those interested in the health and welfare of the wives and infants of the members of our armed forces, and

WHEREAS, The Children's Bureau, a governmental agency, has wisely acceded to the request of the Academy of Pediatrics to call this initial conference with the official representatives of the professions actually rendering service under the E.M.I.C. plan and to consider the problems arising from the application of this plan, be it

Resolved, That it is the sense of this assembly, in view of the extraordinary benefits which have accrued by a meeting of those representing many thousands of servicemen, health professional and lay organizations that future governmental conferences, national, state and local, involving medical services, be similarly composed of the official representatives of professions rendering these services and of the groups receiving them and thereby create in the public interest mutual confidence, cooperation and good will between governmental and medical agencies.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 763 has been approved by the President, amending the Selective Training and Service Act of 1940. It directs the President, among other things, to appoint a commission of five qualified physicians, three of whom shall be civilian physicians not employed by the government, to examine the physical, mental and moral qualification requirements for admission to the armed forces and recommend to the President any changes which it believes can be made without impairing the efficiency of the armed services. The Director of Selective Service, it is contemplated, will cause to be reexamined those men, including those previously discharged from the armed services because of physical disability, who may qualify under any new standards established. This law, too, provides that no individuals shall be called for induction because of their occupations, or by occupational groups, or by groups in any plant or institution, *except pursuant to a requisition by the land or naval forces for persons in needed medical professional and specialist categories.* H. R. 2976 has passed the House, providing that during the present war and for six months thereafter the Superintendent and all other members of the Navy Nurse Corps entitled under existing laws to *relative* rank shall have and be designated by the rank which corresponds to the relative rank originally provided by law for such superintendent and members. This bill has also been favorably reported without amendment by the Senate Committee on Naval Affairs. H. R. 3598 has passed the House and Senate, providing supplemental appropriations for the fiscal year ending June 30, 1944. The sum of $200,000 is provided for the relocation of civilian physicians and dentists. H. J. Res. 208 has been passed by the House, authorizing additional appropriations for the supplying and distribution of farm labor. Medical services may be supplied recruited farm laborers.

Bills Introduced.—S. 1574, introduced by Senator Lodge, Massachusetts, proposes to amend the Pay Readjustment Act of 1942 so as to permit service in the Medical Reserve Corps to be counted for pay purposes. H. R. 3704, introduced by Representative Rivers, South Carolina, provides pay and allowances for temporary members of the Coast Guard Reserve during periods of disability resulting from injuries sustained or disease contracted in active service during the present war. H. R. 3806, introduced by Representative Peterson, Florida, would authorize the President to appoint as commissioned officers in the Medical Corps of the Army and Navy, on the respective recommendation of the Surgeon General of the Army or Navy, morticians who are regularly licensed to practice as such in any state or in the District of Columbia. The Surgeon General of the Army and Navy will be authorized jointly and severally to prescribe regulations to govern the recommendations of such morticians for commissions.

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Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

New Director of Industrial Hygiene.—Dr. George A. Shipman, Atlanta, industrial hygiene physician, Georgia Department of Public Health, has been appointed director of the bureau of industrial hygiene of the Alabama Department of Public Health. Dr. Edwin H. Place, Montgomery, director of the Alabama unit, will take over the activities of Dr. Shipman in the Georgia department.

Physician Sentenced on Murder Charge.—Dr. James Howard Blue, Bessemer, was found guilty by a jury of murder in the second degree and sentenced to fifty years' imprisonment, newspapers reported November 17. Attorneys for the defense announced that motion for a new trial would be filed. At the physician's first trial last September a mistrial was declared. Dr. Blue was charged with the shooting of his wife, May 23.

Changes in Health Officers.—Dr. Lowell L. Stokes, Okmulgee, Okla., U. S. Public Health Service, has been named in charge of the Lauderdale County Health Unit. The position has been vacant since Dr. Julius E. Dunn, Anniston, resigned almost a year ago to become health officer of Etowah and Calhoun counties (THE JOURNAL, January 16, p. 202).——Dr. Jesse P. Chapman, Selma, has been reappointed chairman of the state executive committee of the Women's Field Army of the American Society for the Control of Cancer.——Dr. George E. Newton has resigned as health officer of Autauga and Chilton counties to enter private practice in Prattville.

CALIFORNIA

Personal.—Dr. William McDowell Hammon, assistant professor of epidemiology, George Williams Hooper Foundation, and Herbert G. Johnstone, Ph.D., assistant professor of bacteriology at the University of California Medical School, San Francisco, are studying tropical medicine in Central America through the cooperation of the Office of Inter-American Affairs and of the surgeon general of the army.——Dr. Edwin B. Godfrey, El Centro, has resigned as health officer of Imperial County.

Governor Appoints Committee on Food and Nutrition.—Governor Earl Warren recently appointed the following members to a statewide committee on food and nutrition: Anthony J. Lorenz, California Fruit Growers Exchange, Los Angeles, chairman; Flora Rose, Sc.D., Berkeley; W. D. Hadeler, San Francisco; Ray B. Wiser, California State Farm Bureau, Berkeley; Dr. Langley Porter, San Francisco; Sidney Hoedemaker, Los Angeles; C. J. Haggerty, Los Angeles; R. M. Hagen, Los Angeles, and Mrs. A. R. Jewel, Napa.

Physicians Needed.—The Los Angeles County Civil Service Commission announces a nationwide search for qualified applicants for the positions of assistant chief, emergency medical service, paying $384 to $450 a month and resident physician, M.D. (orthopedic surgery) and resident physician (pathology) paying $158 a month. Applicants for any of these positions must not be over 55 years of age. Full information and applications may be obtained from the office of the commission, room 102, Hall of Records, Los Angeles 12. The last day for filing of applications for the positions is January 5. A position for nurse anesthetist paying $242 to $286.40 a month is also available.

ILLINOIS

Personal.—Dr. Thomas A. Jones, Zeigler, has been appointed superintendent of the general hospital and head of the medical department of the Southern Illinois Penitentiary at Menard.——Dr. Betty A. Nilsson, formerly physician in charge of the Lutheran Hospital at Rajahmundry, India, and head physician, was to leave Rockford in November to return to supervise the institution again. Dr. Virgil E. Zigler has been in charge of the institution since Dr. Nilsson left in 1940 for a furlough in the United States. Both physicians are with the American United Lutheran Mission.——Drs. Fred C. Hamilton and John Archibald Brown were honored at a meeting of the Kankakee County Medical Society November 9 and presented with fifty year certificates and lapel pins testifying to their completion of fifty years in the practice of medicine.

Chicago

Second Hamburger Lecture.—Detlev W. Bronk, Sc.D., Johnson professor of biophysics and director of the Eldridge Reeves Johnson Foundation for Medical Physics, University of Pennsylvania School of Medicine, Philadelphia, will deliver the second Walter Wile Hamburger Memorial Lecture, January 28, under the auspices of the Institute of Medicine of Chicago. The lecture is made possible by a special fund established by the board of governors of the institute in honor of Dr. Hamburger. Dr. Bronk will discuss aviation medicine.

Dr. Slight to Head Mental Examinations for Prospective Draftees.—Dr. David Slight, president of the Illinois Society for Mental Hygiene, on December 13 was named to supervise the new program of mental examinations for prospective draftees in Illinois. Under the plan, medical field agents are to be named for each local board under supervision of Dr. Slight. Their job will be to gather medical, social and educational histories of each registrant who is to be ordered to report for induction, with a view toward weeding out mental or nervous incompetents before they get into training.

Technical Russian.—A course in elementary Russian with special emphasis on the terminology of chemistry, biochemistry, physics and related fields will be offered by the University College of Northwestern University on the Chicago campus next semester. The time for one section has been tentatively set for Tuesday, 8:10 p. m. Additional sections will be offered at other times if there is sufficient demand. The course will include only the necessary minimum of grammar. Exercises in reading and vocabulary building will be based on selected technical material. Supplementary material will be provided for independent exercise in the field of the student's special interest. Prof. J. G. Tolpin, editor of the Survey of Foreign Petroleum Literature, Universal Oil Products Company, is the instructor. He is a graduate of the University of Kiev and has received the master's degree in chemical engineering from Columbia University. He has had wide experience in teaching, research, translating and writing on technical subjects. Further information about the course may be obtained from the University College of Northwestern University.

Graduate Course on Industrial Hygiene.—A postgraduate course in industrial medicine and hygiene will be presented under the auspices of the committee on industrial hygiene of the state medical society and the Chicago Medical Society, January 4-March 28, under the direction of the division of industrial hygiene of the state department of public health and the University of Illinois College of Medicine. The class will be limited to forty physicians and the fee will be $25, registrations to close December 27. Lectures will include:

Dr. Joseph H. Chivers, How Does the Industrial Medical Department Operate?
Dr. Clarence O. Sappington and Mr. Frank Peregrine, Medicolegal Aspects of Industrial Medical Practice.
Drs. Milton H. Kronenberg and Adolph Hartung, The Pneumonoconioses—The Dusty Trades.
Dr. Robert A. Kehoe, Cincinnati, Industrial Toxicology and Poisonings; Lead and the Heavy Metals.
Dr. James H. Sterner, Rochester, N. Y., Industrial Toxicology and Poisonings; Fumes, Gases and Vapors.
Dr. Robert W. Keeton, Medical Problems in Industry.
Dr. Louis Schwartz, Bethesda, Md., Industrial Dermatoses.
Dr. George E. Wakerlin, Industrial Medical Aspects of Fatigue, Noise, Humidity, Temperature Extremes and Abnormal Pressures.
John J. Bloomfield, Bethesda, Protecting the Place of Employment.
Dr. Frederick Slobe, Essentials in Emergency Treatment.
Dr. Harold A. Vonachen, Peoria, Ill., Other Industrial Medical and Surgical Considerations.

On Tuesday, March 28, Dr. Clarence D. Selby, Detroit, will address the dinner session on "Responsibility of the Physician in Industrial Practice."

INDIANA

Medical Society Gives Award to Radio Station.—The Oberlin Award, granted annually by the Lake County Medical Society in recognition of outstanding "uncompensated contributions to the health of the people of Lake County," was received December 9 by radio station WIND of Gary at a dinner meeting held at the Woodmar Country Club in Hammond. A silver plaque was presented to Ralph L. Atlass, president of the company which operates the station. Members of its staff were introduced. In his citation accompanying presentation of the plaque, Dr. Herbert W. Detrick, Hammond, president of the society, declared that for the past five years the station has made its facilities available to the medical

society for the broadcast of information and appeals necessary to the promotion and maintenance of the public health in Lake County communities. The award is the highest recognition the society can confer on an individual or institution, granted only in those years when a truly significant contribution to the public health has been made. The award was established to honor the memory of the late Dr. Thomas W. Oberlin, a charter member of the medical society and a leader in Lake County medical affairs for forty-three years. Dr. and Mrs. Oberlin were killed in an auto accident in 1941.

MINNESOTA

Physical Therapy Course Changed.—The twelve month course for physical therapy technicians at the University of Minnesota, Minneapolis, which started its first summer session in June, will be changed so that matriculation will take place the spring quarter on March 27. Registration for the spring quarter will be on March 24-25. The course will continue as a twelve month program.

Actions of State Medical Board.—On September 15 Judge Oscar R. Knutson of the district court for the fourteenth judicial district issued a bench warrant at Roseau for the arrest of Knute H. Luross, an unlicensed chiropractor, who had been ordered to appear before the court to answer for alleged contempt of court. The defendant has a long record of violating the healing laws of Minnesota, according to the state board of medical examiners. In April 1942, after an investigation by the state board of chiropractic examiners, an order was issued permanently restraining him from practicing healing in the state, including the practice of chiropractic, until he received a certificate of registration in the basic sciences. In August 1943 he was again found to be illegally practicing healing at Roseau. The matter was again investigated by the state board of chiropractic examiners and the defendant was ordered to appear before court on September 15, the contempt charge being based on the alleged violation of the court's injunction in April. Any one having knowledge of the whereabouts of Luross is asked to notify the Minnesota State Board of Medical Examiners.——On November 5 Bernice L. Murdock, proprietress of the Murdock Pharmacy, Minneapolis, paid a fine of $200 in the district court of Hennepin County, following her plea of guilty to a charge of selling paregoric without a medical prescription. Testimony disclosed that the defendant had made ten sales of paregoric to one person between August 27 and October 20, the sales totaling 52 ounces. There was no prescription authorizing any of the sales.

NEW JERSEY

Three Infant Deaths in Diarrhea Epidemic.—Three deaths were reported on December 4 as a result of an epidemic of neonatal diarrhea at the Hackensack Hospital, Hackensack. In a statement to the press Mr. L. Van D. Chandler, health officer of the city, stated that the disease might have some connection with an outbreak of diarrhea in adults which had reached considerable proportions in northern New Jersey.

NORTH CAROLINA

Antinoise Ordinance.—The Charlotte City Council has adopted a new antinoise ordinance, providing a number of new prohibitions with a number of previous regulations to cover noise offenses.

Public Health Officers.—Dr. Ballard Norwood Jr., Oxford, was chosen president-elect of the North Carolina Public Health Association at its annual meeting in Raleigh October 25 and Dr. William P. Richardson, Chapel Hill, was installed as president. Mary Batchelor, Raleigh, is secretary-treasurer.

Personal—Dr. Everett O. Jeffreys, formerly of Philadelphia, has been appointed assistant professor of neurosurgery at the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem.——Dr. Lester A. Crowell Jr., Lincolnton, was elected president of the Board of Medical Examiners of the State of North Carolina at its meeting recently.——Dr. James O. Nolan, Kannapolis, has been appointed a member of the North Carolina State Board of Health, succeeding C. C. Fordham Jr., Ph.G., Greensboro, who is now an officer in the Navy. Other appointments include that of Dr. Hiram L. Large, Rocky Mount.——Dr. Jesse W. Willcox, Wilmington, has been appointed health officer of Moore County, succeeding Dr. Benjamin M. Drake, Carthage, who resigned to accept a similar position in Alamance County.——Dr. Roy H. McDowell has resigned as clinic supervisor of the Durham Health Department to return to private practice.

OKLAHOMA

Personal.—Dr. Mabel M. E. Hart has resigned as director of health for the Tulsa public school system after twelve years' service in the position.——Dr. Victor C. Tisdal has been elected mayor of Elk City. He also served in this capacity in 1939, when he filled an unexpired term.——Dr. Phillip G. Joseph, Oklahoma City, has been named director of the Creek County Health Unit, succeeding Dr. Leland F. Shryock, Oklahoma City.——Dr. William Albert Cook, Tulsa, recently donated his entire personal library to the medical library of the Tulsa County Medical Society.

Physician Named for Hall of Fame.—Dr. Oscar C. Newman, Shattuck, was inducted into the Hall of Fame at the Oklahoma Historical Society, November 16, and honored during the annual banquet of the Oklahoma Memorial Association. Dr. Newman is a pioneer physician of Oklahoma, first locating in Grand, Day County, in 1900, the same year of his graduation at the University of the South Medical Department, Sewanee, Tenn. In 1907 he moved to Shattuck, where he is still practicing and where he established the Newman Clinic. He has three sons who are physicians associated with him in the clinic. Dr. Newman also graduated at the Medical Department of the University of Cincinnati in 1906.

PENNSYLVANIA

Hospital News.—On November 23 ground was broken for an addition to the dispensary building at the George F. Geisinger Memorial Hospital, Danville. The ground floor will house a meeting room with a capacity of 75 to 100 persons. It will be available to any medical, nursing or other hospital group for assembly purposes. The first floor will accommodate an expanded surgical outpatient department, and the second floor will contain a complete suite for the urologic department.

Philadelphia

First Center for Study of Physical Medicine.—The first center for the scientific study and development of physical medicine as a branch of medical practice has been established by the National Foundation for Infantile Paralysis in the Graduate School of Medicine of the University of Pennsylvania. The foundation has given a grant of $150,000 for a five year period from Jan. 1, 1944 to Dec. 31, 1948. According to an announcement, Mr. Basil O'Connor, president of the foundation, stated that this is but the first step in a program which should afford a scientific basis for physical therapy and lead to the establishment of a more desirable teaching program. The Center for Research and Instruction in Physical Medicine will include a center for development of physical medicine as a scientific part of the practice of medicine, a training center for medical leaders and teachers in this branch of medicine and a school for training technical workers under the guidance of such professional and scientific leadership, such a school to be only incidental to and dependent on the first two purposes. The departments of anatomy, physiology, pathology and other basic sciences of the University of Pennsylvania will cooperate in this proposed program. The general direction will be assigned to Dr. Robin C. Buerki, dean of the Graduate School of Medicine. Since it was first organized, the foundation has been continuously concerned with physical medicine in the treatment of infantile paralysis. It has spent during the past six years over $350,000 to educate and train physical therapy technicians. An additional $364,000 has been granted to laboratories and universities to study many problems in physiology and medicine having a close connection with the practice of physical therapy, but never before has it been possible to combine in one place both medical research and teaching in this special field.

TEXAS

Dr. Sulkin Named Director of New Virus Laboratory.—Simon Edward Sulkin, Ph.D., instructor in bacteriology and immunology, Washington University School of Medicine, St. Louis, has been placed in charge of the virus research laboratory now being organized at the medical school of the Southwestern Medical Foundation, Dallas.

University News.—Recent additions to the faculty at Baylor University College of Medicine, Houston, include Drs. Charles M. Aves, professor of clinical surgery (honorary); Thomas H. Compere, associate professor of anesthesia; William W. Coulter, associate professor of pathology, and Otis P. Flynt, associate professor of clinical urology, all of Houston.

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WEST VIRGINIA

Society Opposes Prepaid Medical Plan.—The Cabell County Medical Society, at a special meeting in Huntington December 14, defeated by a margin of but two votes a proposal that the society sponsor a prepaid medical-surgical plan for the county, to be administered by the local hospital service plan association. The vote was taken after the medical service features had been stricken from the proposed contract, which was fashioned after the basic contract approved for use of component societies by a committee composed of members of the fact finding and planning committee of the state medical association. If the objectionable features of the contract can be eliminated, the plan might possibly be resubmitted some time after the first of the year. The county medical society unanimously recommended that a full time county and city health unit be set up in Huntington and that all the health activities of Cabell County be integrated. At the present time a part time unit is functioning in the city.

GENERAL

Neuro-Psychiatric Institute Changes Name.—The Neuro-Psychiatric Institute of the Hartford Retreat, Hartford, Conn., announces that it will henceforth be known as the Institute of Living. The institute is located at 200 Retreat Avenue, Hartford 2, with offices at 459 Marlborough Street, Boston 15, and 610 Park Avenue, New York 21.

Board of Ophthalmology Moves Executive Office.—Effective January 1 the executive office of the American Board of Ophthalmology will move to P. O. Box 1940, Portland 2, Maine. Officers for 1944 are Dr. John Green, St. Louis, chairman, Dr. Frederick C. Cordes, San Francisco, vice chairman, Dr. S. Judd Beach, Portland, secretary-treasurer, and Dr. Theodore L. Terry, Boston, assistant secretary. The 1944 examinations will be held in New York June 3-4 and Chicago October 5-7.

Labor Unions Urge Cooperation with Health Departments.—A resolution was adopted by the American Federation of Labor at its meeting in Boston recently calling to the attention of affiliated unions the fact that local public health departments are prepared to give blood and other tests without charge to the individual and that members of organized labor are encouraged to make proper use of these health protection and promoting facilities. In California a resolution was passed requiring blood tests as a requisite for becoming a member of the American Federation of Labor.

Executive Director Named for Cancer Society.—J. Louis Neff, East Williston, Long Island, N. Y., has been appointed executive director of the American Society for the Control of Cancer. The position is a newly created one and will function independently from that held by Clarence C. Little, Sc.D., managing director. The new appointment will be effective January 1. Mr. Neff has been executive secretary of the Nassau County Medical Society since 1923. He has also been secretary of the Nassau County Cancer Committee, which he helped organize, since 1928. He is a fellow of the American Public Health Association.

Southern Chapter of Chest Physicians Organized.—The Southern Chapter of the American College of Chest Physicians was organized at the Hotel Gibson, Cincinnati, November 18 with Dr. Paul H. Ringer, Asheville, N. C., as president. Other officers in the group include Drs. Alvis E. Greer, Houston, Texas, and Carl C. Aven, Atlanta, Ga., vice presidents and Dr. Benjamin L. Brock, Waverly Hills, Ky., secretary-treasurer. Speakers at the organization meeting included Drs. J. Winthrop Peabody, Washington, D. C., president of the college, and Dr. Evarts A. Graham, St. Louis.

Shipments of Penicillin.—A bulletin from the Air Cargo Department of United Air Lines calls attention to the extreme advisability of having penicillin shipments sent via air express, with priority, in order to insure the fastest possible delivery. C. P. Graddick, director of United's Air Cargo Department, reports that certain critically needed penicillin shipments have, in the past, been delayed through an apparent lack of understanding on the part of physicians and shippers alike regarding the necessity of establishing priorities for such shipments. He is urging all shippers of the drug to obtain such priorities by calling the nearest regional priorities office of the Army Air Transport Command and stating the urgency of the case. In cases in which penicillin (or any other medicinal product) may mean the difference between life and death, such priorities will be granted, Mr. Graddick has been advised.

Allergy Groups Merge.—The Society for the Study of Asthma and Allied Conditions and the American Association for the Study of Allergy were merged on December 4 to form the American Academy of Allergy. Members in the two parent organizations will become members of the academy. Officers are Drs. Robert Chobot, New York, president; Oscar Swineford Jr., Charlottesville, Va., vice president; Karl D. Figley, Toledo, Ohio, treasurer, and William C. Spain, New York, secretary. Members of the executive committee are Drs. Harry L. Alexander, St. Louis, Matthew Walzer, Brooklyn, N. Y., Milton B. Cohen, Cleveland, Robert A. Cooke, New York, and Samuel M. Feinberg, Chicago. According to Dr. Spain, such a merger has been planned for a number of years and was made possible since the two parent organizations were possessed of identical aims and ideals and the membership of the two societies was largely interlocking.

The Academy of Orthopedics.—The twelfth annual meeting of the American Academy of Orthopaedic Surgeons will be held at the Palmer House, Chicago, January 22-26, under the presidency of Dr. Marius N. Smith-Petersen, Boston. The following program has been announced:

Dr. Lenox D. Baker, Durham, N. C., Acute Osteomyelitis with Staphylococcic Septicemia.
Major Champ Lyons, M. C., A. U. S., Penicillin in the Treatment of Septic Gunshot Wounds.
Dr. Arthur G. Davis, Erie, Pa., Nonunions of the Tibia.
Dr. Carroll Glenn Barber, Cleveland, Amputation of the Leg with Induced Synostosis of the Distal Ends of Tibia and Fibula.
Dr. John Albert Key, St. Louis, Amputation for Chronic Osteomyelitis.
Major Hugh M. B. A. Smith Jr., and Capt. Seymour Schotz, M. C., A. U. S., Intravenous Morphine.
Col. Walter Bauer, M. C., A. U. S., The Diagnostic Value of Synovial Fluid Examinations.
Dr. Clay Ray Murray, New York, The Detailed Operative Technic for Open Reduction and Internal Fixation of Long Bone Fractures.
Capt. Camille M. Shaar (MC), U. S. Navy, The Use of the Stader Apparatus in Fresh Fractures.
Dr. Robert W. Johnson Jr., Baltimore, The Application of Haynes's Skeletal Fracture Apparatus to Special Orthopedic Problems.
Comdr. Robert Mazet Jr. (MC), U. S. Naval Reserve, Half Pin Fixation of Fresh and Old Fractures.
Dr. Gerald G. Gill, Oakland, Calif., The Cause of Severe Shortening of the Leg Following Tuberculosis of the Hip in Children: Arrest of Growth from Premature Central Closure of the Epiphysial Cartilages About the Knee.
Comdr. Joseph S. Barr (MC), U. S. Naval Reserve, Medical Audio-visual Education in the Navy.
Drs. LeRoy C. Abbott, Frederic C. Bost, Carl E. Anderson and John B. Saunders, San Francisco, Injuries to the Ligaments of the Knee Joint.
Dr. Allen F. Voshell, Baltimore, Subtibial Collateral Ligament Bursitis: Report of Cases.
Lieut. Col. Theodore Campbell Thompson, M. C., A. U. S., Quadriceps plasty to Improve Knee Function.
Dr. Ralph K. Ghormley, Rochester, Minn., Pedicle Grafts to Deep Skin Defects of the Foot and Ankle.
Dr. Henry Relton McCarroll, St. Louis, Immediate Application of Free Full Thickness Graft for Traumatic Amputation of the Finger.
Dr. Oscar L. Miller, Charlotte, N. C., Orthopedic Surgery in South America.
Dr. Eben J. Carey, Milwaukee, The Effect of Poliomyelitis on the Nerve Endings in Skeletal Muscle.
Dr. Marion Beckett Howorth, New York, Calcification of Supraspinatus Tendon.
Dr. Julius S. Neviaser, Washington, D. C., A Study of the Pathological Findings in Periarthritis of the Shoulder.
Lieut. Comdr. Merrill C. Mensor and Lieut. Frank H. Smith (MC), U. S. Naval Reserve, Fractures of the Pacific Combat Area.
Dr. Robert V. Funsten, Charlottesville, Va., Analysis of Healing and Healing Time in 250 Cases of Fractures in the Shafts of the Tibia and Femur.

Government Services

Urge New Agency on Child Welfare

The establishment of a small federal agency to serve as a clearing house on the subject of juvenile delinquency was suggested at the Senate's subcommittee on wartime health education, December 1, by Richard A. Chappell, chief of probation of the Administrative Office of the United States Courts. Mr. Chappell recommended that the unit should be made up of representatives of several federal departments now concerned with child welfare, such as the Children's Bureau, Public Health Service, Bureau of Prisons, Federal Bureau of Investigation and Federal Probation Service. Michael J. Scott, St. Louis, secretary of the Juvenile Court Judges of America, said that in St. Louis 90 per cent of delinquency arose from "some broken home condition." Dr. Arnold L. Gesell, director of the clinic of child development, Yale University, New Haven, Conn., stated that in the recent six months Connecticut had had a 30 per cent overall increase in juvenile delinquency over the same period last year, and advocated inducting those boys and girls into civic service on a basis of long range planning "with federal affirmation, not with federal funds."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 13, 1943.

Wound Shock and Its Treatment

The Army Medical Department *Bulletin* has issued a supplement on the wounded from El Alamein, containing important observations on wound shock and its treatment. The standard of work in transfusion and surgical services was of a high order even under conditions of great strain during the first forty-eight hours, when units were overwhelmed with casualties. The majority of the wounded at the field ambulance or casualty clearing station were in good condition, including many who had untreated severe wounds and some who had lain for many hours. The occasion was one of the first on which blood and blood substitutes were used on a large scale for resuscitation of battle casualties at the most advanced medical units. The results left no doubt that early transfusion on the battlefield is by far the most important surgical advance of this war. So far as could be seen, the report states, there were no grounds for fears that blood was expended on men without hope of recovery or on those who would have recovered equally well with hot drinks. Some units showed commendable zeal in finding volunteer donors among walking wounded to augment their supplies of blood.

Early operation for penetrating wounds of the abdomen and for emergencies with an immediate threat to life was provided at field surgical units which were attached to field ambulances. This provision was justified by a gratifying reduction in the mortality of abdominal wounds. The experience favored the view that the major cause of wound shock is hemorrhage to the exterior, into body tissue spaces or into body cavities. But there were indications that this was not the only factor. This experience confirmed the teaching that the sooner blood volume was restored the better. The transfusion should be at least equal to the quantity of blood lost. In profound shock, fast transfusion is required. The question of the risks of overloading the heart by fast or large transfusions has often been raised. In shock due to uncomplicated hemorrhage there seems to be no danger in giving plenty of blood quickly. But transfusions were useless in shock from injury to the brain or spinal cord. Rapid transfusions were dangerous in the presence of pulmonary complications, of which fat embolism and blast injuries were the most frequent. Large transfusions were harmful when circulatory failure was due to bacterial infection.

The Polish Faculty of Medicine at Edinburgh University

The only existing scientific institution with university standing which a great European nation has maintained is the Polish School of Medicine in the University of Edinburgh. It is unique in the fact that never before has any state set up its own university with its own professors lecturing to its own students in their native tongue on foreign soil as part of a foreign university. After the collapse of France in June 1940 many Polish medical officers escaped to this country and collected in one of the Polish army camps in Scotland. Among them were several professors, lecturers and specialists of high standing whose knowledge and experience could not be used in the early stages of the reorganization of the Polish army on British soil. Lieut. Col. F. A. E. Crew, commanding the Scottish Military Hospital, was one of the first to realize the needs of Poland, and in October 1940 initiated the scheme which led to the creation of the Polish Faculty of Medicine within the University of Edinburgh.

Prof. Antoni Jurasz, dean of the Polish Medical School, has stated in a press interview that the Poles in Britain were eager to welcome any scheme which would ensure close collaboration of the universities and scientific worlds of the two countries after the war. There has been an increasing response from the Poles here to the establishment of the medical school. The total for the current year was 200 students, and the total number of doctors graduated from the Polish Medical School is 53. The training of undergraduates and newly qualified doctors is carried on in the Paderewski Hospital, which is devoted entirely to the care of Poles in Britain. This hospital was established mainly through the foresight of an American, Mrs. Charlotte Hoffman Kellogg, president of the Paderewski Testimonial Fund, which has provided equipment and individual help to needy students from the Middle East. The doctors at the hospital are all Polish, the heads of the departments being professors or lecturers at the university. There are at present 116 beds, of which two thirds are for medical and the remainder for surgical cases.

BOLIVIA

(From Our Regular Correspondent)

La Paz, Nov. 1, 1943.

Public Health in Bolivia

Newly published is an interesting booklet with statistics and information concerning public health in Bolivia. The author of the bulletin, the first of its kind in this country, is Sir H. E. Navarro, statistics department chief of the Bolivian Health Ministry. The first part of the booklet contains statistics on morbidity and death. Most interesting is the high number of fatalities caused by tuberculosis of the respiratory tract (number 13 of the International Nomenclature); for example, the incidence indicated in the district of Tarija, an essentially agricultural department in the south, is as high as 24 per cent; however, in the district of Potosi, a mining center, the rate is 16.88 per cent. The morbidity rate for malaria is variable—from 0.47 per cent (District of La Paz) to 49.8 per cent (Tarija District).

The statistics indicate that there are 471 medical doctors in Bolivia (not including about 80 foreign doctors), 40 per cent of whom reside in the La Paz district. There are 141 dentists in the whole republic, which has about 3,600,000 inhabitants. The total budget of the Health Ministry was about $1,570,000 in 1942 and something less in 1943.

In its second part the booklet presents statements by various Bolivian physicians. An interesting statement on "Epidemiological Information" by Dr. Corsino Barrera B., epidemiologic department chief, shows that an investigation of 915 nonselected people by Kahn and Wassermann tests revealed 52.9 per cent to be positive. He indicates too that "Deney's Index" for leprosy in the Beni District, where the bulk of Bolivia's rubber is produced, is 350 out of every 10,000 inhabitants. There is not yet any leprosarium in the district. The booklet also includes information presented by the Rockefeller Foundation, in charge of suppressing yellow fever and malaria. About 38,000 people were vaccinated against yellow fever during 1942; a greater number are still waiting.

Another of the cooperating doctors indicates that the infant mortality is higher than in any other country. There are not yet any exact statistical data on this subject. (La Paz cemetery estimates it at about 60 per cent.)

The present booklet is the first attempt at all round Bolivian health statistics, and only one who knows the difficulties of collecting thorough information in Bolivia, especially from the rural districts, can fully appreciate the work involved in this project.

South American Miners' Health

Few people in the United States know much about health conditions in the high altitudes of the South American Cordilleras, and especially in the mines situated there. The following statistics show something of living and health conditions among miners working in altitudes above 13,000 feet, particularly in Bolivia.

The workers are nearly all of the Indian race; most of them are working only temporarily in mines, spending about four months a year on their "farms" at about the same altitudes. There they usually live in a single room, 9 by 9 feet, together with their family and often with their domestic animals such as pigs, sheep and guinea pigs. There are not even the rudiments of sanitary conditions; epidemics, especially of typhus and smallpox, are frequent. Because of the peculiar character of this people, little trustworthy information can be obtained from them. They also have a strong aversion to cleaning either their bodies or their houses and to disinfecting and delousing clothes. Identical findings on this subject were reported by the Bolivian epidemiologist Eduardo Mariscal in 1942. During

TABLE 1.—*Age of Minors*

Age	Percentage of Group
14 years	10.3
to 15 years	16.1
to 16 years	17.2
to 17 years	20.1
to 18 years	36.3

some months of the year, the Indian leaves his "farm" to work in an ore mine. There he is forced into sanitary housing, consisting of two big, decent rooms (bedroom and kitchen), and he gets plenty of cheap food (milk, sugar, flour, rice, fresh meat, vegetables) and decent clothes, all quite unobtainable in his pueblos. But in spite of the adequate dwellings provided, he and his numerous family, including father, children, wife, brothers and often animals, usually live and cook in only one, always closed room—just as they do in their own homes—in order to "spare" the other room!

The men working in the mines usually complain after a few months that they enlisted for work "absolutely healthy" but that their health has suffered on the job—to get the relatively small, but by Indian standards large, indemnifications. The following health statistics refer to a tin mine of medium size situated about 15,000 feet above sea level, in a bad climate even for conditions in the Andes (high prevailing wind; average temperature, 38 F.). Hygienic conditions enforced by the proprietor are satisfactory, and precautions such as helmets and dust masks are provided.

These statistics are based on medical certificates obtained when the men were enlisting for work during the period 1937-1943. They cover 3,414 nonselected Indian workers, with special consideration of the influence of mine work on health. Therefore, results for people who were enlisted in mines for the first time are given apart from veterans. Also a separate classification is provided for minors of less than 18 years of age (we are forced to believe the age statements of the subjects themselves on account of the lack of birth registration figures). Minors form about 20.6 per cent of the whole group investigated.

The average age of adult workers when enlisting is 26.5 years. There are plenty of "beginners" of 40 to 50 years of age. The reason for this is the increased attraction of higher wages during the war. Veterans among the workers had spent an average of two to three years in mine work.

Table 2 shows a comparison of the stages of fitness at the time of enlistment for work.

TABLE 2.—*Stages of Fitness*

	Men		Women		Minors	
	Beginners	Veterans	Beginners	Veterans	Beginners	Veterans
Number examined...	582	1,770	228	151	477	206
Entirely fit, %.....	25.8	17.2	33.8	22.2	74.6	51.8
Partially fit, %.....	41.1	24.3	29.8	22.9	16.6	24.3
Unfit, %.....	33.1	58.5	36.4	51.9	8.8	23.9

The relatively high number of "unfits" among beginners who never before worked in mines is noteworthy. This fact may be attributed to the bad living conditions in their homes and to the inveterate use of "coca."

Table 3 shows the diseases found among miners enlisting for work. We find silicosis due to tin ore dust in first place (about 20 per cent, a relatively low index); then other diseases of the respiratory tract, heart disease and so on.

In the table, silicosis includes only manifest silicosis, and the actual number may be estimated as about 10 per cent higher because of concealed or undetected cases due to the lack of x-ray equipment.

The incidence of dental caries is of special interest. Among those more than 20 years old, about 95 per cent show untreated caries.

The stated incidence of infectious diseases previous to enlisting for work was as follows: smallpox, 6.47 per cent; typhus, 3.93 per cent. Figures for malaria are not available, but I estimate that about 8 per cent have had malaria. The average count of red blood cells is 6,400,000, and the average hemoglobin content is estimated at 87.57 per cent, although these figures are the result of a relatively small number of tests. As to syphilis, the official Bolivian public health statistics indicate an index of 52.9 per cent positive (C. Barrera B.: Información Epidemiológica, 1942). Health conditions in big mining centers nearer to towns are slightly better, but the figures quoted will come close to an all Bolivian mining average. Improved health conditions would do more to increase the output of war essential tin and tungsten ore than financial or technical investments. Unfortunately, however, there is little hope for quick improvement on account of lack of financial means. The actual American help now being provided may be looked on only as a small beginning.

TABLE 3.—*Diseases of Miners Enlisting for Work*

	Men		Women		Minors	
	Beginners	Veterans	Beginners	Veterans	Beginners	Veterans
Silicosis, %.....	....	21.6	....	20.5	....	....
Other respiratory tract diseases, %...	39.9	45.5	40.4	38.6	11.3	39.4
Heart disease, %.....	9.1	12.0	14.5	9.2	1.7	4.0
Varicose veins, %....	10.8	13.1	1.3	5.3	...	...
Hernia, %.....	1.7	6.9	...	...	0.4	...
Bright's disease, %..	1.2	3.9	4.8	0.6	...	...
Arthritis, %.....	2.1	1.4	0.9	...	...	...
Eye diseases, %.....	1.9	8.2	14.0	12.2	...	8.9

Deaths

John Harvey Kellogg ● Battle Creek, Mich., widely known as a health evangelist and director of the Battle Creek Sanitarium, died of pneumonia at his home on December 14, aged 91. Following his graduation from Bellevue Hospital Medical College, New York, in 1875, Dr. Kellogg took up the practice of medicine in Battle Creek. In 1876 he became superintendent and surgeon of the sanatorium then known as the Health Reform Institute. In that position he devoted much of his time to research. He is credited with the invention of much improved apparatus and of instruments for medical and surgical purposes, and also with modifications of many commonly used cereals. Thus it is usually believed that the early cereal products of the General Foods Corporation, developed by Mr. Post, and of the W. K. Kellogg Company resulted directly from the experiments in this direction of Dr. John Harvey Kellogg. In connection with his conduct of the sanatorium, he devoted much attention to the use of physical therapy; he made many interesting innovations in the devices used for this purpose, including particularly the so-called electric light bath and the sinusoidal current.

His numerous writings and lectures on health and hygiene attracted wide attention. He was a member of the Michigan State Board of Health from 1878 to 1890 and from 1912 to 1916. He was a fellow of the American Association for the Advancement of Science, American College of Surgeons, Royal Society of Medicine, England, and the National Geographic Society. He was a member of the American Public Health Association and a corresponding member of the Société d'hygiène de France. As an adjunct to the Battle Creek Sanitarium, he founded and became president emeritus of the Battle Creek College, also founder and president of the Race Betterment Foundation and founder and medical director of the Miami-Battle Creek Sanitarium, Miami Springs, Fla.

Following his marriage, he and his wife provided funds for the education of many boys and girls, rearing over forty children and legally adopting several of them.

He was awarded the honorary LL.D. by Olivet (Mich.) College and by the Lincoln Memorial University.

In the course of his career, Dr. Kellogg held rigidly to a number of concepts, some of which did not meet with general medical approval. These include, among others, vegetarianism, the extensive use of grains, fruits and vegetables in the diet, rigid opposition to tobacco and alcohol, outdoor sleeping, drinking of acidophilus milk and yogurt, specialized types of seating devices and systems of exercise. He placed special stress on multiple daily actions of the bowel. Notwithstanding, in the conduct of the sanatorium he utilized the advances of modern medical science and emphasized the importance of continuous progress. He was widely known to many men of eminence as a health evangelist capable of inspiring good health habits conducive to longevity.

Serge Androp, Talmage, Calif.; Bennett Medical College, Chicago, 1913; Medical Field Service School, Carlisle, Pa., in 1923 and the School of Aviation Medicine, Mitchel Field, Long Island, 1925; member of the Medical and Chirurgical Faculty of Maryland, American Psychiatric Association, Military Order of the World War and the Reserve Officers Association of the United States; specialist certified by the American Board of Psychiatry and Neurology, Inc.; received the Victory Medal and two bronze stars for heroism during World War I; colonel in the medical reserve corps of the U. S. Army not on active duty; formerly assistant in neuropathology at the Johns Hopkins University School of Medicine, Baltimore, and assistant clinical professor of psychiatry at the Marquette University School of Medicine, Milwaukee; served on the staffs of the Johns Hopkins Hospital, Baltimore, Spring Grove Hospital, Catonsville, Md., Ohio Hospital for Epileptics, Gallipolis, Milwaukee County Hospital for Mental Diseases, Wauwatosa, and the Mendocino State Hospital; in 1935 awarded first prize by the Eugenics Research Association for original research on the "probability of commitment for a mental disorder of any kind, based on the individual's family history"; died suddenly, November 8, aged 54, of heart disease following pneumonia.

Verne Carlton Hunt ● Los Angeles; Rush Medical College, Chicago, 1913; clinical professor of surgery at the University of Southern California School of Medicine; at one time assistant professor of surgery, University of Minnesota Graduate School, Minneapolis-Rochester, fellow in surgery at the Mayo Foundation and head of a section in the division of surgery at the Mayo Clinic; member of the founders group of the American Board of Surgery; member of the American Surgical Association, Pacific Coast Surgical Association and the American Urological Association; served as vice president and treasurer of the Western Surgical Association; fellow of the American College of Surgeons; member of the executive committee and surgical staff, St. Vincent's Hospital; shot December 13, aged 55.

Oliver Deveta Hamlin ● Oakland, Calif.; Cooper Medical College, San Francisco, 1894; member of the House of Delegates of the American Medical Association in 1905, 1909, 1911, 1912, 1916 and 1926; past president of the California Medical Association and the Alameda County Medical Association; a founder, formerly a member of the board of governors and life member of the American College of Surgeons; formerly professor of clinical surgery at the Oakland College of Medicine and Surgery; past president of the board of health of Oakland; for many years chief surgeon of the emergency service of the Alameda County Hospitals; served on the staffs of the Providence and Samuel Merritt hospitals; division surgeon for the Southern Pacific Company; died October 11, aged 73.

Edward Sewall Abbott, Bridgton, Maine; the Hahnemann Medical College and Hospital, Chicago, 1885; member of the Maine Medical Association and the New England Obstetrical and Gynecological Society; past president of the Cumberland County Medical Association and the Oxford County Medical Society; served as health officer of the town; formerly president of the Bridgton National Bank and director of the Bridgton Savings Bank; for many years president of the Bridgton Library Association; in 1935 was presented with the fifty year service medal by the Maine Medical Association; president of the Northern Cumberland Memorial Hospital; died October 12, aged 80.

Walter Scott Stewart ● Wilkes-Barre, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1883; member of the House of Delegates of the American Medical Association in 1922; fellow of the American College of Surgeons; veteran of the Spanish-American War; president of the local board of health; chairman of the board of directors of the Kirby Memorial Health Center; member of the board of directors of the Wilkes-Barre General Hospital and on the medical and surgical staff; surgeon for the Lehigh Valley Railroad, Pennsylvania Railroad and the Kingston Coal Company; died October 23, aged 86, of lobar pneumonia.

Walter Franklin Harriman ● Sioux City, Iowa; University of Pennsylvania School of Medicine, Philadelphia, 1924; diplomate of the National Board of Medical Examiners; fellow of the American College of Surgeons; formerly clinical assistant in surgery at the Temple University School of Medicine, Philadelphia; served during World War I; first lieutenant, medical reserve corps, U. S. Army, not on active duty; on the staffs of the Methodist Hospital, Lutheran Hospital, St. Vincent's Hospital and St. Joseph Mercy Hospital, where he died October 11, aged 45, of coronary thrombosis.

Sidney J. Anderson, Midway, Ky.; University of Louisville Medical Department, 1891; member of the Kentucky State Medical Association; served during World War I; died in the Veterans Administration Facility, Lexington, October 21, aged 75, of cerebral hemorrhage.

Varney Andrews, Floydada, Texas; College of Physicians and Surgeons, Baltimore, 1889; for many years health officer of Floyd County; member of the school board for fourteen years; examining physician and a member of the draft board during World War I; died in a Plainview hospital September 6, aged 79.

R. M. Bachtel, Ravenswood, W. Va.; Starling Medical College, Columbus, 1895; died in Spencer October 22, aged 74, of cardiovascular hypertension.

John William Bair ● Homestead, Pa.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1895; on the staff of the Homestead Hospital; died in the Mercy Hospital, Pittsburgh, October 21, aged 74, of uremia.

Max Bakst ● Brooklyn, Long Island College Hospital, Brooklyn, 1911; member of the American Academy of Ophthalmology and Otolaryngology; specialist certified by the American Board of Otolaryngology; associate otolaryngologist at the Beth Moses Hospital; died November 10, aged 57.

Robert Samuel Barr, South Miami, Fla.; Detroit Homeopathic College, 1911; died in the James M. Jackson Memorial Hospital, Miami, October 21, aged 69, of coronary thrombosis.

Frank Jefferson Blodgett, New York; University of Vermont College of Medicine, Burlington, 1881; member of the Medical Society of the State of New York; at one time

clinical assistant in the aural department, Columbia University College of Physicians and Surgeons; served on the staffs of the Manhattan Eye, Ear and Throat Hospital, the New York Eye and Ear Infirmary and the New York Polyclinic Medical School and Hospital; died October 30, aged 86, of cerebral hemorrhage.

Jacob Harry Boss, Tulsa, Okla.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; veteran of the Spanish-American War; formerly coroner of Cherokee County, Kan.; died in the Veterans Administration Facility, Muskogee, October 11, aged 72, of coronary arteriosclerotic heart disease.

Daniel Webster Boyd, Tylertown, Miss. (licensed in Mississippi, year unknown); died October 12, aged 80, of chronic myocarditis and bronchopneumonia.

John Herriott Boyd ● Beavertown, Pa.; University of Pittsburgh School of Medicine, 1931; died October 28, aged 40, of an overdose of chloroform, self administered.

John Colville Bradner ● Middletown, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1907; served as a captain in the 369th Infantry, 93d Division, American Expeditionary Forces and was awarded the Croix de Guerre; consultant on the staff of the Horton Hospital, where he died October 13, aged 61.

Charles Nelson Branin ● Hagerstown, Md.; Baltimore Medical College, 1897; for many years medical examiner for the Western Maryland Railway Company; served during World War I; died October 29, aged 67, of acute pulmonary edema.

Samuel Brister, Philadelphia; Baltimore University School of Medicine, 1899; served in France while in the medical corps of the U. S. Army during World War I; died October 15, aged 71.

George M. Bristow, Princeton, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1877; Louisville (Ky.) Medical College, 1881; member of the Missouri State Medical Association; organizer and first president of the Mercer County Medical Society, a position he held for many years; member of the state legislature from 1920 to 1924; died October 30, aged 88, of pneumonia.

F. Marion Brock Roopville, Ga.; University of Georgia Medical Department, Augusta, 1889; died November 1, aged 79.

Archie Ackers Brown, Carroll, Ohio; Starling-Ohio Medical College, Columbus, 1909; member of the Ohio State Medical Association; died in the Grant Hospital, Columbus, October 28, aged 55.

Walter Thomas Brown ● Wallis, Texas; Louisville (Ky.) Medical College, 1889; died in the Hermann Hospital, Houston, October 18, aged 76.

Albert Frank Burgis, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1918; served during World War I; died October 22, aged 47, of cerebral hemorrhage.

Theodore Burr, Jamaica, N. Y.; University of the City of New York Medical Department, New York, 1895; died November 2, aged 81, of cerebral thrombosis and arteriosclerotic heart disease.

Edward James Callahan, Schuylerville, N. Y.; Albany Medical College, 1914; member of the Medical Society of the State of New York; past president of the Saratoga County Medical Society; health officer and member of the board of education of Schuylerville; served overseas during World War I; died in the Albany Hospital November 8, aged 51, of congestive heart disease.

James Watkins Calloway, Montgomery, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1882; University of Nashville Medical Department, 1883; died in a local hospital October 29, aged 85.

Daniel Alson Campbell, Boonville, Ind.; Kentucky University Medical Department, Louisville, 1904; member of the Selective Service Board of Warrick County; major, medical reserve corps, U. S. Army, not on active duty; served during World War I; formerly a member of the county welfare board and trustee of Boon Township; died October 2, aged 72, of coronary occlusion.

Henry W. Case, Chicago; the Hahnemann Medical College and Hospital, Chicago, 1891; died November 5, aged 77, of angina pectoris.

Eugene S. Clark, Bellingham, Wash.; Minnesota Hospital College, Minneapolis, 1887; formerly associated with the U. S. Public Health Service; died October 22, aged 85, of cerebral hemorrhage.

John Wesley Conrad, Port Carbon, Pa.; Medico-Chirurgical College of Philadelphia, 1916; member of the Medical Society of the State of Pennsylvania; medical examiner for local draft board number 6; served in France during World War I; for many years on the staff of the Good Samaritan Hospital, Pottsville; died November 3, aged 52, of angina pectoris.

Morgan Joseph Cramer Long Island City, N. Y.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1896; served on the staffs of the New York City Hospital, Welfare Island, and the New York Polyclinic Medical School and Hospital; died November 4, aged 71, of pulmonary edema.

Edgar F. Crowther, Yazoo City, Miss.; Louisville (Ky.) Medical College, 1882; died October 20, aged 85.

Thomas Nelson Davey ● Bayonne, N. J.; Trinity Medical College, Toronto, Ont., Canada, 1900; died in the Bayonne Hospital November 7, aged 76, of coronary thrombosis.

James A. De Moss, Thayer, Kan.; St. Louis College of Physicians and Surgeons, 1882; also a minister; died in Chanute October 12, aged 84.

Leonard Albert Dessar, New York; Medical College of Indiana, Indianapolis, 1884; died October 4, aged 79.

Robert H. Dunnington, Daytona Beach, Fla.; Eclectic Medical Institute, Cincinnati, 1874; American Medical College, St. Louis, 1877; died September 14, aged 83.

Carrie Hitchcock Edwards, San Diego, Calif.; Michigan College of Medicine and Surgery, Detroit, 1898; died October 17, aged 73, of left ventricular failure, coronary thrombosis and arteriosclerosis.

Adolph G. Enderle, St. Louis; Missouri Medical College, St. Louis, 1891; died October 20, aged 79.

Walter Eugene Estabrook, Somerville, Tenn.; University of Tennessee College of Medicine, Memphis, 1914; served during World War I; died October 13, aged 55.

George Foster Fiske ● Chicago; Yale College Medical Department, New Haven, Conn., 1883; member of the American Academy of Ophthalmology and Otolaryngology and the American Otological Society, Inc.; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; on the staff of the Henrotin Hospital, where he died October 18, aged 83, of heart disease.

Reuben Fred Frost, Huntington, Ind.; College of Physicians and Surgeons, Baltimore, 1882; member of the Indiana State Medical Association; for many years secretary of the city board of health; on the staff of the Huntington County Hospital; died November 2, aged 87, of senility.

Charles Robertson Gannaway, Kings Park, N. Y.; Northwestern University Medical School, Chicago, 1904; at one time engaged in Near East Relief work; senior assistant physician at the Kings Park State Hospital, where he died November 5, aged 69, of coronary thrombosis.

Andrew J. Goodwin ● Bradley, Ill.; Illinois Medical College, Chicago, 1907; village health officer; president of the Bradley State and Savings Bank; local physician for the Illinois Central Railroad; on the staff of St. Mary's Hospital, Kankakee, where he died October 11, aged 64, of cerebral hemorrhage.

Harold Woodworth Graber, Chicago; Northwestern University Medical School, Chicago, 1926; served during World War I; assistant chief surgeon, Rock Island Railroad; died in the Veterans Administration Facility, Hines, October 17, aged 51, of heart disease and cerebral hemorrhage.

Amos Graves Sr., San Antonio, Texas; University of Pennsylvania Department of Medicine, Philadelphia, 1892; on the staffs of the Medical Arts Hospital and the Santa Rosa Hospital, where he died October 12, aged 73, of carcinoma of the tongue.

H. P. Guthrie, Springfield, Mo.; Barnes Medical College, St. Louis, 1898; died October 11, aged 75.

George Edward Hamilton, Orrick, Mo.; Northwestern Medical College, St. Joseph, 1887; also a druggist; died in the Excelsior Springs Sanitarium and Hospital, Excelsior Springs, November 10, aged 83, of heart disease.

Lorne Edward Hastings ● Philadelphia; Jefferson Medical College of Philadelphia, 1911; also a pharmacist; formerly acting professor of materia medica and pharmacology at the Emory University School of Medicine, Atlanta, and professor

of physiology and pharmacology at the Southern Methodist University Medical Department, Dallas, Texas; served during World War I; died November 6, aged 64.

James Edward Heap, St. Marys, Ohio; Medical College of Ohio, Cincinnati, 1905; member of the Ohio State Medical Association; for many years health officer; served on the staff of the Lima Memorial Hospital, Lima; died October 8, aged 62, of heart disease.

Stephen A. Hemmi, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1884; Rush Medical College, Chicago, 1894; member of the Illinois State Medical Society; formerly on the staff of the Evangelical Deaconess Hospital; died October 27, aged 85, of arteriosclerosis.

Norris Rathbun Higgins, Orange, N. J.; Yale University School of Medicine, New Haven, Conn., 1941; diplomate of the National Board of Medical Examiners; on the courtesy staff of the Orange Memorial Hospital, where he died October 20, aged 28, of pneumonia.

Columbus C. Hill, Galesburg, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; died in St. Mary's Hospital October 18, aged 71, of myocarditis.

Allen G. Thurman Hipps, Asheville, N. C.; Jefferson Medical College of Philadelphia, 1916; served during World War I; a member of the draft board of appeals of Western North Carolina; a physician for the State Highway commission; died in a local hospital October 31, aged 52.

Lieut. Claude R. Huffman (MC), U.S.N.R., 1911-1943

Ralph Hogshead ● Mammoth, W. Va.; Loyola University School of Medicine, Chicago, 1918; at one time secretary of the Fayette County Medical Society; formerly councilor of the Sixth District Medical Society; served during World War I; examining physician for local draft board number 3, Montgomery; physician for the Kanawha and Hocking Coal and Coke Company; died in the Charleston General Hospital, Charleston, October 9, aged 54, of acute dilatation of the heart with pulmonary edema.

Walter Robert Holladay, Meridian, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1919; member of the Mississippi State Medical Association; served during World War I; on the staff of Riley's Hospital, where he died October 20, aged 48, of tuberculosis.

Griffin W. Holland, Eastville, Va.; University of Virginia Department of Medicine, Charlottesville, 1896; member of the Medical Society of Virginia; formerly associated with the U. S. Public Health Service in Memphis, Tenn.; chairman of the board of health; councilor of the First District Medical Society; director of the Eastville Bank; died October 23, aged 69, of cerebral hemorrhage, arteriosclerosis and hypertension.

William Harold Holland ● Lakewood, Ohio; University of Texas School of Medicine, Galveston, 1912; accidentally shot by a hunter while hunting deer in Beauchene, Que., Canada, October 21, aged 60.

Oliver Hopkinson, Merion Station, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1883; for many years on the staff of the Lying-In Hospital, Philadelphia; died October 9, aged 85, of coronary thrombosis.

Felix A. Hughes, Okolona, Ark.; University of Arkansas School of Medicine, Little Rock, 1905; died October 8, aged 68.

Henry Eugene Irish ● Chicago; University of Illinois College of Medicine, Chicago, 1901; professor of pediatrics emeritus at his alma mater; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; served as attending pediatrician at the University and Cook County hospitals; died December 9, aged 66, of coronary thrombosis.

Charles F. Isaacs, Chicago; Northwestern University Medical School, Chicago, 1904; died October 27, aged 66, of coronary thrombosis.

Thourston George Jorgenson, Chicago; Chicago Medical School, 1922; died November 6, aged 53, of chronic myocarditis, arteriosclerosis and acute nephritis.

James Oscar Latta, Clay Center, Neb.; Lincoln Medical College of Cotner University, 1902; member of the Nebraska State Medical Association; past secretary of the Clay County Medical Society; served as mayor and member of the city council; at one time a member of the state commission for the insane; president of the chamber of commerce; died October 6, aged 66.

Fairfield Mortimore, New York; Eclectic Medical College of the City of New York, 1878; died in St. Luke's Hospital September 30, aged 90, of heart disease.

Clinton Francis Rife, Naperville, Ill.; Rush Medical College, Chicago, 1894; formerly a medical missionary; died November 22, aged 76.

George Francis Scheib, Champaign, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1899; member of the Illinois State Medical Society; for many years physician for the Chicago, Milwaukee and St. Paul Railroad; died in the Mercy Hospital, Urbana, November 2, aged 76.

Lieut. Kurt B. Klee M. R. C., U. S. Army, 1913-1943

Thomas James Sheehy, Tomah, Wis.; Bennett Medical College, Chicago, 1912; member of the State Medical Society of Wisconsin; past president of the Wisconsin State Board of Medical Examiners; served during World War I; member of the board of education; died in the Columbia Hospital, Milwaukee, October 13, aged 55, of acute myocarditis and coronary occlusion.

Warren Finley West, Waxahachie, Texas; Jefferson Medical College of Philadelphia, 1886; member of the State Medical Association of Texas and the Texas Public Health Association; served as health officer of Ellis County for twenty-eight years; died in a Dallas hospital September 28, aged 86, of myocardial failure.

KILLED IN ACTION

Claude Raymond Huffman, Knoxville, Tenn.; University of Tennessee College of Medicine, Memphis, 1936; member of the Tennessee State Medical Association; lieutenant, medical corps, U. S. Naval Reserve; commissioned a lieutenant (jg), U. S. Naval Reserve, on June 14, 1941; died in the south Pacific combat area, October 5, aged 32, of shrapnel wounds of the chest and a gunshot wound.

Kurt Benjamin Klee, Indianapolis; Indiana University School of Medicine, Indianapolis, 1940; commissioned a first lieutenant in the medical reserve corps, U. S. Army, on Sept. 19, 1941; began extended active duty on April 10, 1942 and assigned to the Aviation Cadet Board in Boston; served with the paratrooper division; decorated posthumously with the medal of the Purple Heart; killed in action in the North African area July 10, aged 30.

Correspondence

"HOME MADE" PENICILLIN

To the Editor:—Since July 1941 the Northern Regional Research Laboratory, which is one of four regional research laboratories operated by the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture, has been extensively engaged in research on the production of penicillin. This work has been broad in scope, including the isolation of many new penicillin producing organisms, spore selection to secure higher producing strains, improvement of the culture mediums and isolation and purification of the penicillin itself.

During recent weeks a number of scientific articles and press releases have appeared indicating that the production of penicillin preparations suitable for external use is a comparatively simple matter that can be undertaken in laboratories possessing only limited facilities, or even in the kitchen. The work thus reported, in some cases, may constitute noteworthy contributions to the field of penicillin therapy, and it is not our wish to minimize in any way the possible importance of these investigations. We do, however, feel that the time has come when a word of caution should be given. Statements to the effect that Penicillium notatum is the green or blue-green mold found on bread, cheese or other foods are quite misleading if, in fact, not actually dangerous. This species does often occur on these products, but so does a great variety of other blue-green molds. In the genus Penicillium there are literally scores of blue-green species which can be distinguished from Penicillium notatum and its allies only by painstaking laboratory cultivation and microscopic examination. This fact is illustrated by our work of recent months. We have made a concentrated effort to isolate as many strains as possible of Penicillium notatum, Penicillium chrysogenum and other closely related species and have examined hundreds of samples of molded foods, fruits, soils and other possible sources of material. We consider it a conservative estimate that not one out of fifty of the blue-green molds encountered belonged to the Penicillium notatum group. Not more than one out of one hundred represented the species Penicillium notatum itself, and only a limited number of these produced appreciable yields of penicillin.

The metabolic products of only a few of the other blue-green species of molds have been adequately studied, and it is entirely possible that among them exist some species or strains that are capable of producing, in considerable quantity, substances as toxic to animals as to certain pathogens which infect them. A number of blue-green molds, such as Penicillium citrinum, Penicillium spinulosum, Penicillium puberulum, Penicillium aurantio-virens, Aspergillus clavatus, Aspergillus fumigatus and Gliocladium fimbriatum, are already known to produce bactericidal substances, some of which are quite toxic when injected into laboratory animals. One therefore should be extremely careful in the selection and maintenance of cultures for use in the production of penicillin.

Contamination of Penicillium notatum cultures with other blue-green species or with pathogenic organisms is also a matter of serious concern. This is emphasized by the fact that, in certain recent cases, experienced workers have started with a good penicillin producing culture and subsequently found this to have become contaminated or even replaced by an entirely different species or strain. In the hands of inexperienced workers, or in laboratories with inadequate facilities, this possibility is multiplied manyfold. If a contaminating organism should produce some material toxic to man, the dangers involved might be very considerable. In the present state of our knowledge of the metabolic products of the blue-green Penicillia and Aspergilli as a whole, the indiscriminate selection of newly isolated cultures for penicillin production should not even be considered until their correct identity is established.

Owing to the pressure of other work, the staff of this laboratory is not in a position to check the correctness of all cultures which may be used in this type of experimentation. We have, however, deposited with the American Type Culture Collection, 3900 Reservoir Road, Washington, D. C., cultures of the two strains of Penicillium notatum which are being used almost universally in industry for the production of penicillin, and these are available on request for a nominal charge.

Another possibility which must be considered when using these crude forms of penicillin is that the patient may conceivably become sensitized to mold protein, which is inevitably present in such preparations. The danger of this would be particularly great when these protein containing solutions are applied to an extensive burned area. Commercial preparations of penicillin are protein free and have been thoroughly tested for bactericidal activity, pyrogens, toxicity and sterility.

In summary, we feel that there is inherent danger in the proposed practice of using "home made" penicillin, for the reasons outlined.

KENNETH B. RAPER, PH.D.
ROBERT D. COGHILL, PH.D.
Peoria, Ill.
Senior Microbiologist and Chief, respectively, Fermentation Division, Northern Regional Research Laboratory.

ESSENTIAL HYPERTENSION

To the Editor:—The editorial comment on the etiology of hypertension (THE JOURNAL, November 20, p. 772) discusses—and, because of its important etiologic and therapeutic implications, perhaps too briefly—a study which proposes to demonstrate that essential hypertension is of vasomotor origin. The authors (Gregory, Raymond; Lindley, E. L., and Levine, Harry: *Texas Rep. Biol. & Med.* **1**:167 [No. 2] 1943) seem to base their study on the following considerations:

1. Essential hypertension is the result of arteriolar vasoconstriction.

2. This vasoconstriction is either humoral or neurogenic in origin.

3. Spinal anesthesia decreases blood pressure greatly in hypertensive subjects; in normal subjects "there was a slight fall in the blood pressure of several patients during spinal anesthesia. . . ." However, "the blood pressures in the group with normal pressures remained essentially the same during the period of spinal anesthesia" (p. 180).

4. It is concluded that the hypotensive effect of spinal anesthesia is due to release of the abnormal arteriolar vasoconstriction.

5. Since the hypotension develops rapidly after induction of the anesthesia, it is also concluded that the release of vasoconstriction is not due to interference with a humoral renal pressor system, and that the demonstration has been made that the vasoconstriction is neurogenic.

The first two propositions are matters of general agreement. The third we can accept only with reservation. The hypertensive's arterial pressure has a good deal farther to fall than has that of the normotensive. But, comparing the hypotensive effect of high spinal anesthesia (tenth dorsal) in normal subjects and in our hypertensives (as shown in the table) we observe that proportionately to the control level of arterial pressure the hypotensive effects in the two groups are very similar. The distinction between the effect of anesthesia in normotensive and in hypertensive subjects is therefore qualitative only. It is not, as the authors seem to imply, a distinction of kind.

With this in mind, one proceeds to proposition 4 with greater reservation. The complex circulatory effects of spinal anesthesia in normotensive and hypertensive subjects have recently been reviewed by Page (*Anesth. & Analg.* **22**:196 [July-Aug.] 1943) and need not detain us here. In one study (Smith,

Effect of Spinal Anesthesia on Renal Function of Normal Persons and of Patients with Two Types of Arterial Hypertension

	Mean Arterial Pressure, per Cent of Change	HD/TmD, per Cent of Change	Afferent Renal Resistance, per Cent of Change	Efferent Renal Resistance, per Cent of Change	Total Renal Resistance, per Cent of Change
Normal subjects					
Smith et al. (Lamport)					
Mean	−17	....	−70	−0.2	−32
"Neurogenic" patients (7)					
Mean	−24	+18	−57	−28	−48
Essential hypertensives (4)					
Mean	−1	−5	+5	−4	+3

Summary of observations on the etiologic distinction of types of arterial hypertension in man by spinal anesthesia. The observations noted as "normal subjects" are obtained from Lamport's (J. Clin. Investigation **20**:535 [Sept.] 1941) recalculation of data obtained by Smith, Rovenstine, Goldring, Chasis and Ranges (Ibid. **18**:319 [May] 1939). The numerals in the first column indicate the number of patients in each group. The functional distinction in arteriolar response to spinal anesthesia is shown by the mean differences in each of observations made during the first twenty-five minutes of anesthesia from control levels.

H. W.; Rovenstine, E. A.; Goldring, William; Chasis, Herbert, and Ranges, H. A., *J. Clin. Investigation* **18**:319 [May] 1939) cogent evidence is presented for the view that such vasodilatation as may develop is largely postarteriolar (capillaries, venules, veins) and not arteriolar. Indeed, such evidence as Gregory, Lindley and Levine present on this point, namely the depression of urea clearance (p. 184) during anesthesia in hypertensives and the rise of blood pressure during vomiting, suggests that some mechanism other than arteriolar vasodilatation must account for the hypotension. The persistent pressor effect of epinephrine which they observed during the hypotension is hardly evidence of the "functional integrity of the peripheral vasoconstrictor apparatus" (p. 195), for it seems likely that the pressor effects of this drug are, in this circumstance, the result of its cardiac and venopressor activities and that its net arteriolar effect is in fact dilator (Smith and others).

One cannot therefore accept the proposition that a decrease of arterial pressure in hypertensives subjected to spinal anesthesia is the result of arteriolar vasodilatation. And, in view of this, the rate of fall and rise of pressure in such subjects is not germane to the discussion.

Arterial pressure is at best a secondary and, as we have seen, sometimes nonrevealing expression of arteriolar constriction. But study of the arterioles themselves would seem more likely to provide information on the origin of hypertension. Fortunately, methods are available by which arteriolar reactions of the renal vascular bed, carrying as it does about one fourth of the cardiac output, can be studied. Thus, it has been shown that the activity of the renal vasopressor system (renin, renin substrate, angiotonin) is associated with renal vasoconstriction which develops in both the afferent and the efferent glomerular arterioles. A similar renal vascular status in most patients suffering from arterial hypertension leads naturally to the view that the renal pressor system operates in this disease. Many other evidences supplement this view (Page, I. H.: *Bull. New York Acad. Med.* **19**:461 [July] 1943). The absence of such vasoconstriction in many other hypertensive patients suggested (*Proc. Central Soc. Clin. Res.* **15**:72 [Nov.] 1942) that factors other than the renal vasopressor system, presumably vasomotor, maintain the elevated arterial pressures found in the latter patients. An objective means of distinction between etiologically separate types of arterial hypertension may thus have been provided.

However, in individual cases some of the data overlapped between the groups. We have therefore used high spinal anesthesia as a means of functional renal denervation, having in mind the hypothesis that we might thus abolish the renal vasoconstriction which originates in vasomotor impulses while leaving unchanged that due to humoral pressor agents. The results of this study were described by Page (*Anesth. & Analg.*) and recently reported in more detail (Page, I. H.; Taylor, R. D.; Corcoran, A. C., and Mueller, L. B.: *Proc. Central Soc. Clin. Res.* **16**:13 [Nov.] 1943).

Analysis of the data was complicated by the changes in arterial pressure, common to normal people, so-called "neurogenic" hypertensives and, in less degree, "essential" hypertensives. A means of differentiating the arteriolar responses was provided by calculations of renal arteriolar resistance (Lamport, *J. Clin. Investigation* **22**:461 [May] 1943). The results are summarized in the table. Briefly, subjects with "neurogenic" hypertension exhibited renal arteriolar vasodilatation when renal vasoconstrictor pathways were interrupted by spinal anesthesia; such decreased arteriolar resistance did not develop in equal degree in patients whose hypertension seemed of renal humoral origin.

Much more must be done before it can be claimed with complete certainty that essential hypertension is, in certain cases, vasomotor in origin. Thus, while discounting the evidence presented by Gregory, Lindley and Levine, we agree with the general thesis that in some hypertensives the disease is probably neurogenic. But in so doing, although proceeding by objective methods, we advance only a little further in certainty than does the general practitioner who has the hunch that the nervous system is overactive in certain hypertensives and proceeds to give them sedatives. We therefore hark back to an earlier impression (Corcoran, A. C., and Page, I. H.: Arterial Hypertension, THE JOURNAL, Feb. 22, 1941, p. 690) that "the clinical picture and course of each case of hypertension is . . . probably a composite of the degree and kind of renal, endocrine and nervous participation." In particular, we do not agree that arterial hypotension due to spinal anesthesia in

patients with established and severe hypertensive arteriolar disease testifies to vasomotor origin of their condition. As a matter of fact, it is exactly such patients who consistently show evidences of humoral renal participation. It is only those in whom organic arteriolar disease is absent or minimal who consistently show evidences of vasomotor origin.

A. C. CORCORAN, M.D., Indianapolis.

ECG FOR ELECTROCARDIOGRAM

To the Editor:—The word "electrocardiogram" and its abbreviation "ECG" have surely become sufficiently familiar to English speaking readers to make it unnecessary, improper and even at the present time highly objectionable to see the German abbreviation "EKG" appearing frequently in English speaking medical journals. In the journal of which I am editor, we hope to avoid this error. If it could be kept out of all American Medical Association journals this turn of the tide would soon spread to other American medical journals.

E. B. KRUMBHAAR, M.D., Philadelphia.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Dec. 18, page 1076.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Feb. 21-24. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Jan. 4-5. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: San Francisco, Jan. 4-6. Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

COLORADO: * Denver, Jan. 5-7. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

CONNECTICUT: *. *Medical. Written.* Hartford, March 14-15. *Endorsement.* New Haven, March 28. Sec., to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, March 13-14. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Written.* Dover, Jan. 11-13. *Endorsement.* Dover, Jan. 18. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

IDAHO: Boise, Jan. 10. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 18-20. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

IOWA: * Iowa City, Dec. 27-29. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, Feb. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

MAINE: Portland, March 14-15. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 14-17. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEVADA: *Endorsement.* Carson City, Feb. 7. Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Feb. 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, New York, Buffalo and Syracuse, Jan. 24-27. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 4-7. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OKLAHOMA: * Oklahoma City, Dec. 27-29. Sec., Dr. J. D. Osborn Jr., Frederick.

OREGON: * Portland, Jan. 26-29. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, Jan. 4-6, Bedside, Jan. 6-8. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH DAKOTA: * Pierre, Jan. 18-19. Dir., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Pierre.

TENNESSEE: * Memphis and Nashville, Dec. 20-22. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

UTAH: *Examination.* Salt Lake City, Dec. 28-30. Asst. Dir., Department of Registration, Miss Rena B. Loomis, 324 State Capitol Bldg., Salt Lake City.

WASHINGTON: * Seattle, Jan. 10-12. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

WEST VIRGINIA: Charleston, Jan. 3-5. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.

WYOMING: Cheyenne, Feb. 7-8. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: Feb. 12. Address State Board of Healing Arts, 250 Church St., New Haven.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Dr. J. F. Conn, John B. Stetson University, DeLand.

IOWA: Des Moines, Jan. 11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Jan. 14-15. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Jan. 4-5. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Omaha, Jan. 11-12. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Feb. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, March 4. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 16. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Cancer Allegedly Resulting from Trauma.—While bowling in 1933 the workman injured the ligaments of his left knee. Shortly thereafter he "bumped" his left knee when his foot slipped off the running board of a car. Apparently some condition developed that prevented him from working for a few years. In October 1934 he consulted Dr. Wirka in a neighboring state and it was discovered that he had "a giant celled benign tumor at the head of the tibia" of the left leg, and the tumor was excised. From that time on he was examined two or three times yearly. In 1937 Dr. Wirka permitted him to return to work. In the course of his employment, Jan. 1, 1941, he slipped and fell on his left knee. He could not rise and was picked up by fellow workmen, who rubbed his knee. He rested a short while and worked at less arduous tasks for the remainder of the work day. According to the workman, the knee turned black and blue within ten or fifteen minutes after the fall and continued to be sore and swollen for four or five months, although the next day in reporting the accident to his employer the workman stated that he did not need a physician. He continued to work until May 1941, when he quit work for a few weeks to take treatments from a chiropractor. He visited Dr. Wirka in

June 1941 and a "biopsy was made showing an osteogenic sarcoma at the head of the tibia." On June 14 his left leg was amputated at the midthigh. Subsequently he brought proceedings under the workmen's compensation act of Michigan for compensation, claiming that the sarcoma which necessitated the amputation resulted from the fall in his employment. From an award in his favor the employer and his insurance carrier appealed to the Supreme Court of Michigan.

The principal question was whether or not the evidence adduced at the hearing justified the deputy commissioner, department of labor and industry of Michigan, who conducted the hearing, in the finding inherent in the award of compensation that the cancerous condition which necessitated the amputation was caused by the single fall in the course of employment. At the hearing the workman called as a witness Dr. Marcos Fernan-Nunez, a pathologist, who had never treated the workman, who had never seen him until he was called as a witness and who obtained the information on the basis of which he testified from testimony he heard in the case, from letters from Dr. Wirka and from "slides" sent him by that physician. One slide, it was claimed, was made of tissue removed from the tumor in 1934 and the other of tissue removed at the time of the amputation in 1941. This physician apparently attempted to testify that the industrial accident in this case had resulted in a cancer and that there was no relation between the so-called benign tumor which had been excised in 1934 and the cancer that made the amputation imperative. The employer and his insurance carrier objected to this physician's testimony on the ground that the slides were not introduced at the hearing and that the witness was basing his testimony on what another physician had told him. The deputy commissioner held that the testimony could not be considered unless the slides were introduced and a deposition of the physician who had written to the witness was obtained, neither of which was done, and subsequently the testimony of Dr. Fernan-Nunez in this respect was withdrawn. The effect of this, said the Supreme Court, was to leave the workman without any medical testimony except as herein noted, yet nevertheless the deputy commissioner awarded compensation. The workman, however, claimed that the exclusion of the testimony referred to in no way affected other testimony of the witness to the effect that a single trauma may cause cancer and that a benign tumor never becomes malignant. But, said the Supreme Court, this witness could not testify as to the character of the tumor excised in 1934, as the slide was not introduced and he never saw the tumor and had not observed the workman's knee during the years after the 1934 operation. Dr. Wirka, who attended the plaintiff in 1934 and subsequent years and who performed the amputation, was called as a witness by the employer and his insurance carrier. He testified that he assisted in the operation in 1934 for the removal of the giant cell benign tumor and that he examined the workman from year to year thereafter and from a roentgenogram that was taken in 1940 prior to the alleged accident and introduced as an exhibit he testified:

> That is an x-ray, AP and lateral views, upper three fifths of the tibia and fibula and lower one fifth of the femur. In the upper one fifth of the tibia there is an area of increased density in the posterior part of the bone with an area of rarefaction on the anterior surface plus another area of rarefaction on the posterior lip of the tibial articulation. There is irregularity of the joint outline, there being an enlargement of the lateral portion of the tibia table. The x-ray represents a lesion showing both increased rarefaction and areas of hypertraction of lime salts.

This physician further testified that no single trauma had ever been proved to produce cancer or that it aggravated a benign tumor that had previously existed so as to cause it to become malignant; that when the workman came to him in June 1941 he made no mention of any accident in January of that year. Another physician called by the defendants testified that black and blue spots would not develop within fifteen minutes after a trauma.

The workman testified at the hearing on re-cross examination that he consulted a Dr. Schroeder in 1934, before he consulted Dr. Wirka, when he was having trouble with his knee and that he brought suit against Dr. Schroeder on account of his treatment or lack of treatment of the knee. An objection of the workman's attorney to this testimony was sustained. Thereon the attorney for the defendants stated that he would offer proof that the workman in connection with the same knee trouble started suit against Dr. Schroeder and alleged in a sworn bill of complaint that Dr. Schroeder did not properly diagnose his condition, that he was suffering from a malignant tumor and that that physician paid the workman $1,000 in settlement of the suit. The deputy commissioner refused to permit any testimony along that line. Subsequently the attorney for the defendants filed a petition to take further testimony to show that the bill of complaint against Dr. Schroeder for malpractice stated that "plaintiff's leg had become almost useless and permanently crippled" and also that the workman was examined in 1936 by two other physicians and roentgenograms of the workman's knee were examined by still another physician, all of which plaintiff had concealed at the hearing of the deputy commissioner. The petition in this respect of the defendant was denied. This was error, said the Supreme Court. It was the duty of the department of labor and industry to ascertain all pertinent facts.

The burden of proof, continued the Supreme Court, was on the workman. This court has been liberal in not rigidly insisting on adherence to the stricter rules of evidence in hearings before the department of labor and industry. Almost the entire testimony of Dr. Fernan-Nunez became worthless as he was testifying in regard to slides about which he could not be cross examined and also in regard to what had been told him by another physician and what he had heard during the taking of testimony before a deputy commissioner. Such testimony was withdrawn. He did, however, state that a single trauma could cause cancer and that a benign tumor does not become malignant. However, the tumor if benign no longer existed as it had been excised and the cancer appeared in the same situs from which the tumor had been removed in 1934. The workman's own physician, Dr. Wirka, however, testified wholly in favor of the employer and his insurance carrier. That physician stated that a single trauma could not cause cancer and that the workman had not told him that he had suffered from a fall in 1941. He further showed that it was necessary to examine the workman each year after 1934, and that in 1940 he took a roentgenogram of the workman and at the situs of the cancer there was an increased density of the posterior part of the bone, increased rarefaction and other unfavorable symptoms. It is very possible that the department of labor and industry might have reached an entirely different conclusion if it had the testimony before it in regard to the malpractice suit brought against Dr. Schroeder and the testimony of the other physicians at the time. It seemed to the court that the employer and his insurance carrier were entitled to bring out those facts.

For the reasons stated, the award in favor of the workman was vacated and the cause was remanded to the department to enable the employer and his insurance carrier to present the testimony indicated.—*Veek v. Wesley Freight Co., 11 N. W. (2d) 213 (Mich., 1943).*

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, February 15-16. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, February 14-15. Dr. Victor Johnson, 535 N. Dearborn St., Chicago 10, Secretary.

American Academy of Orthopaedic Surgeons, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Annual Forum on Allergy, St. Louis, Jan. 22-23. Dr. Jonathan Forman, 394 East Town St., Columbus, Ohio.

Clinical Orthopaedic Society, Chicago, January 22-26. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

Society of Surgeons of New Jersey, Atlantic City, January 29. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1933 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Fort Wayne, Ind.

10:365-406 (Oct.) 1943

Value of Proctoscopy in Diagnosis of Amebiasis. R. J. Jackman and W. L. Cooper.—p. 365.
Pathogenicity of Intestinal Protozoa. H. W. Soper.—p. 366.
Value of Cough Sign in Acute Appendicitis. S. Ben Asher.—p. 368.
Plan of Treatment for Diabetic Acidosis. D. P. Foster, W. L. Lowrie and J. MacMillan.—p. 371.
Report of Case of Diverticulum of Stomach (Cardia). B. Resnick.—p. 380.
Absorption of Iron from Ferrous Sulfate with Observations on Hemoglobin Changes and Influence of Certain Intestinal Protozoa. Alice G. Marsh, Ruth M. Leverton, Thelma J. McMillan and G. R. Underwood.—p. 382.
Planned Dietary in Treatment of Addison's Disease with Desoxycorticosterone Acetate. T. H. McGavack and Louise Babcock.—p. 385.
Further Studies on Relationship Between Composition of Diet and Metabolism of Ascorbic Acid. I. Patterson and Anne Bourquin.—p. 390.
Some Effects of Diets Rich in Glycerides of Saturated Fatty Acids on Intestinal Elimination: II. Helen L. Wikoff, J. F. Caul and B. H. Marks.—p. 395.

American J. Obstetrics and Gynecology, St. Louis

46:479-622 (Oct.) 1943

Control of Puerperal Infection in United States During Last Century. C. E. Heaton.—p. 479.
*Vitamin A During Pregnancy, Labor and Puerperium. C. J. Lund and Marian S. Kimble.—p. 486.
Comparative Blood Sugar Studies in Parturient Woman and Newborn Infant. B. J. Hanley and Paula Horn, with technical assistance of Amy Farmer.—p. 502.
Bowen's Disease of Vulva. R. van Dyck Knight.—p. 514.
Treatment of Placenta Previa: Bagging versus Cesarean Section. B. P. Watson and S. B. Gusberg.—p. 524.
Value of Mixed Conjugated Estrogens from Pregnant Mare's Urine in Treatment of Menopause: Preliminary Report. T. Neustaedter.—p. 530.
Clinical and Laboratory Study of Synthetic Estrogenic Substance Octofollin. M. R. Talisman.—p. 534.
Local Use of Sulfonamide Drugs in Certain Gynecologic Operations. W. Richards.—p. 541.
Lactogenic Effect of Prolactin in Human Being. S. G. Winson.—p. 545.
Severe Preeclampsia. C. M. McLane and Katherine Kuder.—p. 549.
Hematoma of Rectus Abdominis Muscle in Pregnancy: Report of Case and Review of Literature. R. Torpin.—p. 557.
Premature Separation of Normally Implanted Placenta: Study of 93 Cases. J. A. O'Regan.—p. 566.
Unusual Decidual Reaction of Cervix. J. P. Hennessy.—p. 570.
Theca Cell Tumor of Ovary and Carcinoma of Endometrium. J. D. Kirshbaum.—p. 573.
Full Term Abdominal Pregnancy. A. J. Kolak.—p. 577.
Advanced Unruptured Tubal Pregnancy. B. Mann and D. R. Meranze.—p. 580.
Severe Preeclampsia with Separation of Retina. P. B. Wahrsinger.—p. 581.
Fatal Staphylococcus Bronchopneumonia Following Ritual Circumcision. L. W. Sauer.—p. 583.

Vitamin A During Pregnancy, Labor and Puerperium.—Lund and Kimble stress that pregnancy increases the need for vitamin A. There is no complete agreement about the magnitude of the need, the manner in which it shall be filled and the consequences of failure to meet it. The authors began their study in July 1940 and continued it through December 1942. Such a long period was necessary for the determination of seasonal variations as well as individual variations throughout pregnancy and the puerperium. Over 400 determinations of plasma vitamin A and an equal number of determinations of plasma carotene were made on 215 pregnant women who came from various social and economic classes. Plasma vitamin A values during pregnancy reflect the dietary intake of the vitamin. As the pregnancy progresses the vitamin A values decrease, but the appearance of the decrease is delayed according to the adequacy of the diet. There was no correlation between plasma vitamin A and carotene values. The relationship between these two substances in the blood stream remains obscure. Plasma vitamin A values were generally low in women who had not received antepartum care. The ingestion of an adequate diet according to accepted standards provides enough vitamin A to maintain normal blood values during the first trimester. During the second trimester 5,000 international units of vitamin A daily is necessary in addition to an adequate diet. This amount should be increased to 10,000 international units during the last trimester. Needs during the puerperium can usually be supplied by a good diet alone unless lactation is unusually abundant and prolonged.

American Journal of Physiology, Baltimore

140:1-124 (Oct.) 1943. **Partial Index**

Capillary Permeability to Horse Proteins in Burn Shock. M. G. Netsky and S. S. Leiter.—p. 1.
Basal Metabolism of Midwestern College Women. Martha S. Pittman and others.—p. 33.
Indicator Yellow. A. C. Krause.—p. 40.
Effect of Adrenalectomy on Absorption of Short Chain Fatty Acids and Their Triglycerides. L. A. Baretta.—p. 44.
Study with Radioactive Isotopes of Permeability of Blood-Cerebrospinal Fluid Barrier to Ions. D. M. Greenberg and others.—p. 47.
Efficacy of Isotonic Sodium Chloride and Glucose Solutions in Preventing Shock Following Venous Occlusion of Limb in Dog. L. N. Katz, L. Friedberg and R. Asher.—p. 65.
Studies on Physiology of Manganese in Rat. L. W. Wachtel, C. A. Elvehjem and E. B. Hart.—p. 72.
Peripheral Visual Acuity of 100 Subjects. F. N. Low.—p. 83.
Adrenals and Hypophysis in Carbohydrate Metabolism of Eviscerated Rat. Jane A. Russell.—p. 98.
Observations on Injury and Repair of Peripheral Nerves. H. E. Essex and N. de Reende.—p. 107.
Comparative Study of Muscle Atrophies Caused by Denervation and Acute Inanition. H. M. Hines, J. D. Thomson and B. Lazere.—p. 115.
Effect of Anoxia on Peristalsis of Small and Large Intestine. E. J. van Liere, D. W. Northup, J. C. Stickney and G. A. Emerson.—p. 119.

American Journal of Public Health, New York

33:1187-1308 (Oct.) 1943

Epidemiology of Epidemic Keratoconjunctivitis. J. E. Perkins, R. F. Korns and R. S. Westphal.—p. 1187.
Practical Study of Lauryl Sulfate Tryptose Broth for Detection of Presence of Coliform Organisms in Water. M. H. McCrady.—p. 1199.
Poliomyelitis in Cuyahoga County, Ohio, 1941. M. Kramer, J. A. Toomey, H. J. Knapp and J. A. Doull.—p. 1208.
*Food Borne Streptococcus Outbreak. V. A. Getting, S. M. Wheeler and G. E. Foley.—p. 1217.
Illness Caused by Cadmium. J. J. Schiftner and H. Mahler.—p. 1224.
Biologic Changes in Theiler's Virus of Spontaneous Mouse Encephalomyelitis. C. W. Jungeblut.—p. 1227.
Etiology of Malignant Diphtheria. M. Frobisher Jr.—p. 1244.
Use of Modern Laboratory Aids in Investigation of Typhoid Fever Outbreak. E. R. Schlesinger.—p. 1257.
*Epidemic Diarrhea of Newborn: Report of Two Outbreaks. P. A. Lembcke, J. J. Quinlivan and N. G. Orchard.—p. 1263.

Food Borne Streptococcic Outbreak.—Getting and his associates report an unusual outbreak of scarlet fever which occurred in a Massachusetts town in July 1941. The outbreak was traced to food served at a church reunion. There were 24 cases of scarlet fever, 56 of septic sore throat, 7 of diarrhea, 4 of vomiting, 3 of nausea and 8 with miscellaneous complaints. The source of infection proved to be ground ham which had been cooked and prepared by a woman who was in the preeruptive stage of scarlet fever. Gastrointestinal symptoms were predominant. Laboratory analysis revealed Lancefield group A, Griffith type 2, hemolytic streptococci from the ground ham, from the throat of the food handler and from the throats of 9 patients. The production of an enterotoxic substance from a ham substrate is discussed.

Epidemic Diarrhea of the Newborn.—Lembcke and his associates report two outbreaks of diarrhea in newborn infants which occurred in a hospital in Rochester, N. Y. The first epidemic, involving 22 mild and 28 severe cases with 3 deaths, occurred in April and May. Two of the 3 deaths occurred in infants with birth injury or congenital abnormality. The diarrhea was significantly more frequent and more severe among infants artificially fed than among the breast fed. Opportunity for transmission of infection was afforded by contamination of nipples and formula. Delay and inadequacy in recognition and isolation of cases may have been contributory. The epidemic

came to a close following correction of these faults. A second epidemic of diarrhea of the newborn consisting of 21 mild, nonfatal cases occurred in the same hospital in July 1942. Illness was limited almost exclusively to breast fed infants. Opportunity for transmission of infection was afforded by probable contamination of a common vessel of 4 per cent boric acid used to cleanse the breasts. The epidemic came to a close after correction of this fault. The etiologic agent was not determined, but it is present in the intestinal and possibly the oral discharges of sick infants. The occasional introduction of the disease into a nursery, probably from an inapparent adult source, is difficult to prevent. Prevention and control depend on laboratory controlled methods of sterilizing nipples and formula, good nursing technic, prompt recognition, reporting and isolation of cases, and immediate epidemiologic investigation.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

50:433-574 (Oct.) 1943

Some Changes Made in Care of Civilian Patients Due to War Conditions. C. C. Sturgis.—p. 433.
Acute Pneumonitis. W. G. Scott and H. L. Jones Jr.—p. 444.
*Chronic Cor Pulmonale. L. G. Rigler and P. Hallock.—p. 453.
Technic for Locating and Identifying Pericardial and Intracardiac Calcifications. M. C. Sosman.—p. 461.
Ice Skater's Fracture: Form of Fatigue Fracture. C. F. Ingersoll.—p. 469.
Adamantinoma: Report of 8 Cases. L. K. Chont.—p. 480.
*Pulmonary Metastasis and Pneumonitis Following Radiation Therapy for Cancer of Breast. E. P. Pendergrass and G. White.—p. 491.
*Frequency, Clinical Course and Treatment of Metastases from Cancer of Breast. J. R. Freid and H. Goldberg.—p. 499.
Effect of Irradiation on Composition and Vascularity of Growing Rat Bones. C. L. Hinkel.—p. 516.
Unusual Case of Pulmonary Osteoarthropathy in Dog. E. G. Wissing and L. Weisz.—p. 527.
Relation of Focal Spot to Field Distribution. Lillian E. Jacobson.—p. 530.

Chronic Cor Pulmonale.—Rigler and Hallock define "cor pulmonale" as enlargement of the right side of the heart, with or without failure, initiated by increased resistance to blood flow within the lesser circulation as a result of pulmonary disease. The diagnosis of cor pulmonale presents many difficulties. To obtain definite objective evidence, recourse must be had to electrocardiography and roentgen examination, the latter being the most valuable. Enlargement of the right heart and failure is a comparatively frequent and important cause of death in chronic tuberculosis, in bronchial asthma, in emphysemas and in silicosis. It is the usual cause of death in pulmonary arteriosclerosis. Every case of chronic lung disease should be examined with this in mind. The characteristic enlargement of the pulmonary artery and the right ventricle can be demonstrated by roentgenoscopic and roentgenographic study in all positions. The roentgen findings are the most important means of establishing the presence of right heart enlargement before failure has supervened and are most helpful in the differential diagnosis.

Pulmonary Metastasis and Pneumonitis Following Radiation Therapy.—Pendergrass and White attempted to determine whether radiation given prior to the formation of metastases will influence the type of shadow that the subsequent metastatic lesions will produce, and whether infiltrative metastases of the lung from cancer of the breast can be differentiated from chronic radiation pneumonitis. They studied 54 cases of cancer of the breast with three types of pulmonary metastases, the nodular, the infiltrative and the pleural. The roentgen appearance of the nodular type is that of varying sized, discrete, circumscribed, dense areas distributed throughout the parenchyma. The infiltrative type is characterized by closely spaced, coarse, linear shadows starting in the hilar region and progressing toward the periphery of the lung in a fan shaped fashion. The pleural type is seen as dense nodules or thickened localized areas on either the parietal or the visceral pleura or on both. Pleural effusion may obscure the nodules. In order to demonstrate the nodules it is necessary to withdraw the fluid and introduce air into the pleural cavity before making the roentgenograms. Large amounts of premetastatic irradiation to the lung fields are associated with the infiltrative type of metastases, while the nodular type usually occurs where little or no radiation has been given. The pleural type of metastases appears equally after all degrees of irradiation. Radiation pneumonitis presented elevation of the dome of the diaphragm on the affected side, retraction of the mediastinal structures, contracted hemithorax and changes in the lung fields. In 3 cases with pneumonitis following irradiation they have observed emphysematous bleb formation on the affected side. The authors agree with Warren and Gates that the term radiation pneumonitis is preferable to that of pleuropneumonitis. The roentgen manifestations of radiation pneumonitis are in many instances similar to those found in infiltrative metastases from cancer of the breast. In many instances differentiation is impossible.

Metastases from Cancer of Breast.—Freid and Goldberg present a study of patients with cancer of the breast who died while in the Radiotherapeutic and Surgical Services of the Montefiore Hospital for Chronic Diseases, New York City. In diffuse cutaneous lesions treatment is frequently fruitless. If the localized infiltrations are confined to a small area, radiotherapy is preferable to surgery. The authors used roentgen therapy generated at low or medium voltage. Skeletal metastases were observed in 81 out of 168 cases (48 per cent). Most skeletal metastases were multiple and were rarely preceded by metastases in other tissues. The following bones, among others, were involved in the order mentioned: pelvis, spine, femur, ribs, skull, humerus, scapula and clavicle. Irradiation of skeletal metastases produced results ranging from partial palliation of pain to permanent control of individual lesions. The authors found pulmonary pleural and mediastinal metastases in 47 per cent of 168 cases at Montefiore Hospital with only partial postmortem confirmation. In a group of 131 postmortems on patients with cancer of the breast who died in Montefiore Hospital 89 per cent presented these types of metastases. There is no agreement as to beneficial effects of radiotherapy in the treatment of pulmonary metastases from mammary cancer. Regarding metastases to the central nervous system the authors say that treatment in advanced lesions is usually palliative. Patients with metastases who have not reached the menopause should receive roentgen castration. It is debatable whether such patients without metastases should be so treated.

Annals of Internal Medicine, Lancaster, Pa.

19:567-706 (Oct.) 1943

Some New Approaches to Physiology of Thyroid. J. H. Means.—p. 567.
*Radio Phosphorus—An Agent for Satisfactory Treatment of Polycythemia and Its Associated Manifestations: Report of Case of Polycythemia Secondary Possibly to Banti's Syndrome. L. A. Erf and H. W. Jones.—p. 587.
*Treatment of Meningococcus Carriers with Sulfadiazine. F. S. Cheever, B. B. Breese and H. C. Upham.—p. 602.
Hepatic Damage Associated with Sulfonamide Therapy in Infants and Children: I. Morphologic Pathology. Maud L. Menten and Marie A. Andersch.—p. 609.
Id.: II. Changes in Liver Function Test During Sulfonamide Therapy. Marie A. Andersch.—p. 622.
*Value of Examination of Gastric Contents for Tubercle Bacilli. J. A. Foley and J. B. Andosca.—p. 629.
Embolism and Thrombosis of Popliteal Artery—Diagnosis and Treatment. J. C. Doane.—p. 634.
Changes of Water Tolerance Test in Hepatic Disease. D. Adlersberg and C. L. Fox Jr.—p. 642.
On Importance of Malaria as Cause of False Positive Serologic Reactions. T. R. Dawber.—p. 651.
Thrombosis and Embolism of Abdominal Aorta. I. Greenfield.—p. 656.

Radio Phosphorus in Polycythemia.—Erf and Jones reported clinical and hematologic improvement in 6 cases of polycythemia following administration of radio phosphorus. The patients were maintained in clinical and hematologic remissions for nearly two years. Four of the 6 required no additional radio phosphorus, 1 was given one intravenous injection and another two courses of three injections each of radio phosphorus. The authors report 11 new cases of polycythemia in which radio phosphorus was used. All had received other forms of treatment previous to radio phosphorus, such as roentgen radiation, ultraviolet irradiation to the skin or to autotransfused blood, solution of potassium arsenite, phenylhydrazine and venesection, but none gave satisfactory remissions. The radioactive phosphorus solutions were given intravenously. The total dosage varied between 7 and 11 millicuries. The first significant hematologic responses occurred from sixty to one hundred days after the first injection. The patients gained weight, developed unusually good appetites and had clinical and hemato-

logic remissions. The authors conclude that at the present radio phosphorus is the most convenient and satisfactory therapeutic agent for the treatment of polycythemia and its associated manifestations.

Treatment of Meningococcus Carriers with Sulfadiazine.—Cheever and his associates report an outbreak of meningococcic infections which had occurred in a large naval construction training center during the winter of 1942-1943. Cases of meningitis and of uncomplicated septicemia were observed; in over 90 per cent of these a type I meningococcus proved to be the causative organism. The response to sulfadiazine therapy was gratifying; the mortality rate remained in the neighborhood of 5 per cent. A carrier rate determination on a representative sample of the camp's population gave a total incidence of 57.6 per cent. Men from a barrack known to have a high carrier rate were divided into two equal groups. These men lived, worked and messed together. On the first day nasopharyngeal cultures were taken on all men; those in the first group were given 3 Gm. of sulfadiazine in divided doses on the first day and similarly 3 Gm. on the second and 2 Gm. on the third day, each man receiving a total of 8 Gm. in seventy-two hours. The second group, serving as a control, was left untreated. On the fourth day cultures were made again on both groups, and urine specimens obtained from men who had received the drug. On the seventh day another nasopharyngeal culture was taken on each man. All of 161 carriers given 8 Gm. of sulfadiazine had become negative by the fourth day. After an additional three days during which they received no further treatment 160, or 99.51 per cent, remained negative. The control group receiving no treatment showed a statistically significant increase in the total carrier rate during the first seventy-two hours, and during the second seventy-two hours a slight decrease. Sulfadiazine is apparently fully as effective as other members of the sulfonamide group in the treatment of meningococcus carriers.

Tubercle Bacilli in Gastric Contents.—Foley and Andosca report that out of 639 cases with negative sputum 187, or 29.2 per cent, were found to be positive by gastric lavage; 32 nontuberculous subjects employed as controls were all negative. Guinea pig inoculation of gastric contents gives a higher percentage of positive results than direct microscopy. Gastric lavage is an aid not only in establishing the diagnosis of pulmonary tuberculosis but also in its differential diagnosis, treatment and prognosis. It is an accurate gage of the infectiousness of a patient and helps to determine his relationship to society.

Archives of Otolaryngology, Chicago

38:309-412 (Oct.) 1943

Effects of Nasal Inhalers on Erectile Tissues of Nose: Quantitative Studies. D. B. Butler and A. C. Ivy.—p. 309.
Osteoma of Frontal Sinus: Report of Case. W. H. Johnston.—p. 318.
Local Treatment of Acute Rhinitis with Sulfathiazole. E. Ebert.—p. 324.
Fluid in Middle Ear. L. Shahinian.—p. 328.
Atresia of External Auditory Canal. L. Cohen and S. L. Fox.—p. 338.
Use of Curare to Facilitate Endoscopy: Preliminary Report. S. C. Cullen and A. J. Trapasso.—p. 347.
Percussion Note of Maxillary Sinus. W. Hewson.—p. 350.
Effect of Extrinsic Laryngeal Muscles on Voice Production. R. R. Scholowsky.—p. 355.
*Treatment of Certain Forms of Deafness by Means of Benzyl Cinnamate: Preliminary Report. J. Jacobson.—p. 365.
Audiometric Effects of Voluntary Contraction of Tensor Tympani Muscles. H. D. Smith.—p. 369.
Paranasal Sinuses. S. Salinger.—p. 373.

Benzyl Cinnamate for Certain Forms of Deafness.—Jacobson noted in the course of treatment with benzyl cinnamate of corneal opacities in 2 patients with interstitial keratitis and deafness a regression of the corneal lesions and improvement in hearing. He next treated 45 patients with deafness who had failed to respond to the classic method of treatment. Each patient received one intramuscular injection of 0.33 to 1 cc. of a 3.2 per cent solution of benzyl cinnamate for a period of twelve days. He was then allowed a period of rest of ten to fifteen days. Thereafter the injections were resumed, and after the third series of injections the patient was given one month's rest. The same cycle may be repeated after an interval of about two months. A follow-up of 32 patients revealed that 17 stated that their hearing had improved; of the 24 who complained also of tinnitus, 2 reported its disappearance, 7 stated that it had diminished, while 15 observed no change. Dizziness which had accompanied the deafness in 9 of the 32 patients disappeared in 3 and diminished in 5.

Archives of Surgery, Chicago

47:319-418 (Oct.) 1943

Caution Against Too Liberal Use of Citrated Blood in Transfusions. J. Bruneau and E. A. Graham.—p. 319.
Effects of Morphine in Experimental Shock Due to Hemorrhage. A. Blalock.—p. 326.
Arterial Blood Supply of Breast: Revised Anatomic Data Relating to Reconstructive Surgery. J. W. Maliniac.—p. 329.
Adventitious Bursas. R. M. Buck, J. R. McDonald and R. K. Ghormley.—p. 344.
*Effect of Sulfathiazole Administered Orally and Sulfanilamide Implanted Locally on Contaminated Wounds: Experimental Study. J. W. Lord Jr., A. H. Blakemore and P. L. Stefko.—p. 352.
Hemangioma of Synovial Membrane of Knee Joint Cured by Synovectomy. P. H. Harmon.—p. 359.
Spontaneous Closure of Arteriovenous Fistula: Report of Case. R. F. Barber and J. L. Madden.—p. 364.
Role of Chemical Laboratory in Diagnosis of Neoplastic Diseases of Bone. Helen Quincy Woodard.—p. 368.

Sulfathiazole Administered Orally and Sulfanilamide Locally.—During a study of a method of bridging a gap in a severed femoral artery in dogs, Lord and his collaborators accumulated data concerning the value of sulfanilamide implanted locally and of sulfathiazole administered orally. The right femoral artery was exposed in 20 animals under unsterile conditions, the incision being 10 cm. in length. The artery was isolated for 2 cm. and divided between transfixion ligatures. Twenty-four hours later the animal was again anesthetized and after preliminary irrigation of the femoral wound on the right side with saline solution a 10 to 12 cm. segment of the left femoral vein was removed under aseptic conditions. The vein was set aside, care being taken to keep it sterile, and the femoral wound on the right side was excised. The wound was irrigated with 250 cc. of saline solution. The two tube nonsuture technic was then carried out, vitallium tubes 3 mm. in outside diameter being inserted into the segment of the left femoral vein. The wound was closed. After seven days all wounds were opened and the anastomoses examined to determine blood flow. The anastomosis was resected and examined for thrombosis. In 10 animals the Carrel suture technic was substituted for the anastomosis of the segment of vein to the cut ends of the right femoral artery. A second variation was that the wounds were studied for fourteen days instead of seven. Into alternate wounds of all 30 dogs 1.5 Gm. of powdered sulfanilamide was sprinkled at the time of the arterial anastomosis. To 10 of the 20 dogs for which the two tube technic was used 1 Gm. of sulfathiazole was administered orally twice daily. To all 10 of the dogs for which the suture technic was used 1 Gm. of sulfathiazole was administered similarly. Therapy with sulfathiazole was begun at the time of the unsterile division of the femoral artery. In the undebrided wound local implantation of sulfanilamide was of little value. In the debrided wound sulfanilamide applied locally was of value in the healing and in the success of the anastomosis. Sulfathiazole administered orally was slightly more efficacious than sulfanilamide implanted locally. The most satisfactory healing of wounds and the greatest number of successful anastomoses resulted from the combined use of sulfathiazole orally and sulfanilamide locally when careful débridement was done.

Florida Medical Association Journal, Jacksonville

30:89-132 (Sept.) 1943

Medical Stewardship in War and Peace. C. W. Roberts.—p. 103.
Appendicitis: Results of Surgical Treatment Under Varying Conditions at Duval County Hospital. J. B. Stewart.—p. 110.
Emergency Medical Management in Great Britain. A. J. Logie.—p. 113.

30:133-172 (Oct.) 1943

The Doctor in the War Effort. S. W. French.—p. 145.
Preliminary Study in Use of Continuous Caudal Anesthesia. J. R. Graves.—p. 148.
Aqueous Vanadium Tetrachloride and Its Possible Use in Syphilology. R. S. Leopold and C. B. Pollard.—p. 150.

Journal Industrial Hygiene & Toxicology, Baltimore

25:323-380 (Oct.) 1943

Physiologic Response of Animals to Cyclohexane, Methylcyclohexane and Certain Derivatives of These Compounds: II. Inhalation. J. F. Treon, W. E. Crutchfield Jr. and K. V. Kitzmiller.—p. 323.
*Determination of Monomeric Styrene in Air. V. K. Rowe, G. J. Atchison, E. N. Luce and E. M. Adams.—p. 348.
Determination of Oxides of Nitrogen in Air. J. Cholak and R. R. McNary.—p. 354.
Nitrite Field Method for Determination of Oxides of Nitrogen. F. A. Patty and G. M. Petty.—p. 361.
Acute Toxicity of Vapors of Certain Solvents Containing Appreciable Amounts of Benzene and Toluene. J. L. Svirbely, R. C. Dunn and W. F. von Oettingen.—p. 366.
Effects of Repeated Exposures of Rats to Vapors of Monoalkyl Ethylene Glycol Ethers. H. W. Werner, C. Z. Nawrocki, J. L. Mitchell, J. W. Miller and W. F. von Oettingen.—p. 374.

Determination of Monomeric Styrene in Air.—Rowe and his associates point out that the increased production of monomeric styrene for the manufacture of Buna S rubber, together with its growing use in other fields, has placed more and more men in contact with this material. Extensive laboratory work on animals has led to the proposed maximum allowable concentration of 2 mg. per liter (approximately 400 parts per million) for repeated eight hour exposures. Chemically monomeric styrene is vinyl benzene. Several physical methods for the analysis of air for monomeric styrene vapor are possible. The apparatus and methods described by the authors have been used and found to be satisfactory for the trapping of monomeric styrene vapor from the air in preparation for the determination by the infra-red, ultraviolet or nitration method. The ultraviolet method for the determination of monomeric styrene is applicable in the presence of benzene, ethylbenzene, toluene, butadiene and vinyl cyanide. The infra-red method is applicable in the presence of benzene and ethylbenzene, but the presence of other impurities limits its use. The nitration method is most suitable for the majority of laboratories. The monomer is nitrated in a carbon tetrachloride solution, the acid layer extracted and diluted to volume with water, and the yellow color developed is measured with a suitable colorimeter.

Journal of Pediatrics, St. Louis

23:371-496 (Oct.) 1943

Blood Sucking Vectors of Encephalitis: Experimental Transmission of St. Louis Encephalitis to White Swiss Mice by American Dog Tick, Dermacentor Variabilis Say. R. J. Blattner and Florence M. Heys.—p. 371.
Experimental Investigation of Measles. G. Rake.—p. 376.
Early Radiologic Recognition of Mitral Valve Disease. B. S. Epstein.—p. 381.
Effect of Illness and Other Factors on Appearance Pattern of Skeletal Epiphyses. L. W. Sontag and Janet Lipford.—p. 391.
Case of Vitamin D Deficiency Associated with Cirrhosis of Liver and Dyscrasia of Calcium and Phosphorus Metabolism. H. F. Fraser.—p. 410.
Studies in Hormone Therapy: I. Evaluation of Growth Hormone Treatment. A. A. Strauss and E. H. Watson.—p. 421.
*Protection of Infant Against Diphtheria During First Year of Life Following Active Immunization of Pregnant Mother. J. Liebling and H. E. Schmitz.—p. 430.
Evaluation of Blood and Urinary Thiamine Determinations in Vitamin B_1 Subnutrition. R. A. Benson, C. M. Witzberger and L. B. Slobody.—p. 437.
Comparative Effects of Ammoniated Mercury, Sulfathiazole and Soap and Water on Surface Bacteria of Newborn Infant. W. R. MacLaren.—p. 446.
*Treatment of Cryptorchism: Report on Treatment in Thirty-Eight Cases with Chorionic and Pituitary Gonadotropin and Testosterone. F. E. Harding.—p. 451.
Peptic Ulcers in Infancy and Childhood: Postmortem Studies of 8 Cases; 1 Case of Possible Poisoning by Rhubarb. Miriam C. Benner.—p. 463.

Protection of Infant Against Diphtheria by Immunization of Mother.—Studies on the occurrence of diphtheria antitoxin in the blood of pregnant mother and infant were presented by Liebling and Schmitz in previous articles. In this paper they present additional observations on nonimmunized and actively immunized mothers and relate what effect such immunization had on the infant during the first year of life. They conclude that active immunization of the pregnant mother results in an increased placental transfer of passive immune bodies to the offspring. The increase in passive immune bodies to the offspring is prolonged sufficiently to increase the protection during the first year of life. Shick tests on pregnant mothers immune to diphtheria acted as secondary antigenic stimuli, causing increased antitoxin formation. This was sufficient to prolong the passive immunity in the offspring of this group of mothers. Schick tests on infants immune to diphtheria did not increase their antitoxin titers. The decline of passive immune bodies in the offspring is two to five times greater than the decline of active immune bodies in the respective mothers.

Treatment of Cryptorchism.—Harding reports observations on 38 cases of cryptorchism which were treated with chorionic and pituitary gonadotropin and with testosterone. Cryptorchism without mechanical obstruction may be corrected with endocrine therapy. The testes descended in 76 per cent of the patients in this series. With endocrine treatment obstruction can be diagnosed early so that necessary surgery can be performed not later than the prepuberty period, thus preventing the atrophy which occurs in the testis allowed to go through puberty undescended. Certain mental and physical conditions make it advisable to treat some of these boys at a younger age. When descent does not follow treatment, orchiopexy must be used to prevent sterility, hypogonadism, complications and possibly malignancy. Operation should be facilitated by treatment that lengthens the spermatic cord and enlarges the scrotum and testis. There was no harm to the testes regardless of the age at which the boy was treated.

Minnesota Medicine, St. Paul

26:849-936 (Oct.) 1943

Recent Advances in Our Knowledge of Coronary Sclerosis and Its Bearing on Clinical Management of Patients. A. R. Barnes.—p. 863.
Hypertension Heart. G. Fahr.—p. 867.
Psychosomatic Aspects of Hypertension: Review of Literature. W. H. Hengstler.—p. 870.
Medical Management of Early Cases of Hypertension. S. G. Sax.—p. 874.
General Care of the Aged. J. F. Norman.—p. 876.
Nutritional Management of the Aged. E. L. Tuohy.—p. 881.
Surgical Treatment of the Aged. O. T. Clagett.—p. 884.
Studies on Diagnosis and Treatment of Epidemic and Experimental Poliomyelitis with Poliomyelitis Antistreptococcic Serum: Summary of Results. E. C. Rosenow.—p. 890.

New England Journal of Medicine, Boston

229:605-638 (Oct. 14) 1943

Global Malaria. J. S. Simmons.—p. 605.
Newer Concepts of Gonorrhea. S. N. Vose.—p. 610.
*Supralevator Abscess. E. A. Gaston and L. O. Warren.—p. 613.
Intravenous Use of Lanatoside C. J. H. Nicholson.—p. 619.
Treatment of Sinusitis. R. L. Goodale.—p. 622.

229:639-666 (Oct. 21) 1943

Wartime Responsibilities of United States Public Health Service. W. F. Draper.—p. 639.
Effect of Sulfanilamide Powder on Healing of Sterile and Infected Wounds, with Special Reference to Tensile Strength and Ascorbic Acid Content in Scar. C. M. Jones, M. K. Bartlett, Anna E. Ryan and Gladys D. Drummey.—p. 642.
Rhinoscleroma: Report of Case. E. Kellert.—p. 647.
Prolonged Ureteral Obstruction with Recovery Following Administration of Sulfadiazine and Sulfathiazole. S. J. Sugar.—p. 651.
Pancreatic Insufficiency and Celiac Syndrome. S. Farber.—p. 653.

Supralevator Abscess.—According to Gaston and Warren, infections occurring about the rectum and anus are classified as infralevator or supralevator according to their anatomic relation to the pelvic diaphragm. Infralevator infections are relatively frequent and their surgical treatment is well understood. Supralevator abscess is a rare disease. It seems logical to assume that such infection usually arises in the mucocutaneous line and is carried by lymphatic drainage to the supralevator space. The clinical picture is essentially one of prolonged sepsis associated with a perirectal mass and, eventually, with pelvic pain and low intestinal obstruction. Male patients frequently present symptoms of obstruction of the bladder neck of greater or lesser severity. The diagnosis is not difficult if the condition is kept in mind. Treatment consists in adequate surgical drainage. Preliminary sigmoidostomy is occasionally indicated in cases seen late in the disease or in the presence of fistula.

New York State Journal of Medicine, New York

43:1791-1902 (Oct. 1) 1943

Extent of Syphilis Problem at Beginning of World War II. R. A. Vonderlehr and Lida J. Usilton.—p. 1825.
Venereal Diseases: Navy Problem. L. A. Shifrin.—p. 1829.
Venereal Disease Control as Applied to Army. W. Bisher.—p. 1832.
Clinical Types of Coronary Insufficiency and Their Recognition. R. L. Levy.—p. 1836.
Principles Underlying Operative Approach to Treatment of Myocardial Ischemia. C. S. Beck.—p. 1841.
Diagnosis of Pancreatic Disease. J. H. Pratt.—p. 1847.
*Surgical Therapy for Patent Ductus Arteriosus. R. E. Gross.—p. 1856.

Surgical Therapy for Patent Ductus Arteriosus.—Gross states that closure of the ductus arteriosus has now been performed on 50 patients varying in age from 11 months to 37 years. There were only 2 deaths. The results of the operation were beneficial. Patients who were previously backward in their physical development had a subsequent gain in weight. Those who had varying degrees of cardiac disability or limitation of their physical activities have spontaneously undertaken more physical exertion after operation and had disappearance of their cardiac symptoms. In the early part of the series some persons were left with a minimal fistula. The large opening was reduced to a very small one but was not completely shut off. This failure of the method to produce absolute closure in some instances has now made it advantageous to resort to the more difficult but ideal operation of complete division of the ductus. This has been successfully accomplished nine times without complication and without mortality.

Pennsylvania Medical Journal, Harrisburg

47:1-96 (Oct.) 1943

Surgical Principles of Rhinoplasty. L. Felderman.—p. 13.
Outline of Plan and Work of Division of Cancer Control of Pennsylvania Department of Health. S. P. Reimann.—p. 21.
Percussion Sign in Coronary Disease. A. S. Gabor.—p. 25.
Viruses, Fungi, Protozoa and Insects: Preliminary Report with Review of Literature. A. E. Taft.—p. 26.
Soft Tissue Injury Coincident with Fractures. H. R. Owen and W. H. Erb.—p. 33.
Atypical Scabies: Diagnosis by Scrape and Smear Method. R. Friedman.—p. 39.
Postoperative Wound Infections in Small Hospital. C. H. Smith.—p. 42.
Nutrition Today: Application to Clinical Practice of Laboratory Methods for Determining Nutritional Status. Pauline Beery Mack.—p. 44.
Protein Metabolism. R. H. McCoy.—p. 49.

Public Health Reports, Washington, D. C.

58:1497-1532 (Oct. 8) 1943

*Study of Outbreak of Food Poisoning in Hospital in Galveston, Texas. L. L. Lumsden, C. A. Nau and F. M. Stead.—p. 1497.
Harborage of Rattus Rattus Alexandrinus. B. K. Milmore.—p. 1507.
American Q Fever: Occurrence of Rickettsia Diaporica in Amblyomma Americanum in Eastern Texas. R. R. Parker and G. M. Kohls.—p. 1510.

58:1533-1572 (Oct. 15) 1943

Automatic Control of Exposure in Photofluorography. R. H. Morgan.—p. 1533.
Successful Treatment of Granulocytopenia and Leukopenia in Rats with Crystalline Folic Acid. F. S. Daft and W. H. Sebrell.—p. 1542.
War and Distribution of Physicians. G. St. J. Perrott and B. M. Davis.—p. 1545.
Frequency and Duration of Disabilities Causing Absence from Work Among Employees of Public Utility, 1938-1942. W. M. Gafafer.—p. 1554.

Outbreak of Food Poisoning in a Hospital.—Lumsden and his associates report an outbreak of food poisoning in a large general hospital with 390 patients and 610 personnel having meals regularly in the hospital. About 22 per cent of the patients and over 50 per cent of the personnel were attacked. The clinical manifestations in general were very similar, with nausea, vomiting, abdominal cramps and purging predominant. The outbreak was widely distributed among the patients and personnel but was confined to those who ate chicken prepared in one common kitchen and served on July 6, 1943 at the noonday meal. The hygienic and sanitary conditions under which the foods in the implicated meal were prepared, stored and distributed were found to be unsatisfactory. Chicken salad was the sole medium of conveyance. The causative agent was a bacterial toxin produced by Staphylococcus aureus of the specifically enterotoxin forming type. The introduction of Staphylococcus aureus on or into the chicken may have been by human hands, dropping perspiration, floating droplets from the nose or throat of some of the food handlers in the kitchen; by flies, roaches, mice, or other vermin, or through air currents. Most probably it was introduced by human hands. The chicken probably became contaminated with the staphylococci during the process of handling and exposure of the meat in the kitchen. There was a tremendous multiplication of the infecting organisms in the meat during storage in the refrigerator and during the several hours that the meat was being made up into salad in the high temperature of the kitchen. The detection of the staphylococci in the bones from which the meat for the salad was removed eliminates the mayonnaise dressing, the eggs and the celery used in the salad as being together or separately a factor in the causation of the outbreak. The temperature of the refrigerator room in which the large mass of hot chicken was placed for storage was not maintained at a sufficiently low degree.

Surgery, Gynecology and Obstetrics, Chicago

77:449-556 (Nov.) 1943

Value of Vaginal Smear in Diagnosis of Uterine Cancer. J. V. Meigs, Ruth M. Graham, M. Fremont-Smith, I. Kapnick and R. W. Rawson.—p. 449.
Surgical Treatment of Acquired Aneurysm and Arteriovenous Fistula of Peripheral Vessels: Reviews of 67 Cases. J. deJ. Pemberton and B. M. Black.—p. 462.
New Test for Pancreatic Function: II. Experimental Observations. H. L. Popper, W. H. Olson and H. Necheles.—p. 471.
Studies on Therapy of Hemorrhagic Shock: II. Effects of Iso-Osmotic and of Concentrated Serum and Plasma in Dehydrated Dogs. S. O. Levinson, Martha Janota, R. E. Weston and H. Necheles.—p. 475.
Wound Healing Experimental and Statistical Study: V. Bacteriology and Pathology in Relation to Suture Material. S. A. Localio, W. Casale and J. W. Hinton.—p. 481.
Horizontal Pin Fixation for Fractures of Mandible Using Pin Guide. D. F. Pincock.—p. 493.
Protruded Intervertebral Disks. J. G. Love and M. N. Walsh.—p. 497.
*Coagulum Contact Method of Skin Grafting as Applied to Human Grafts. M. E. Sano.—p. 510.
Umbilical Hernia in Bad Risk Patient. W. A. White Jr.—p. 514.
Half Ring Splint for Fractures of Femur and Tibia and for Other Disabilities of Lower Extremity. C. S. Young.—p. 518.
Reconstruction of Breast Deformities. H. May.—p. 523.
Use of Fascial Sutures in Inguinal Hernia. C. C. Burton.—p. 530.
Living Fascial Sutures in Repair of Inguinal Hernia. W. J. Ryan.—p. 535.
Pregnancy in Monkey After Removal of Fetus. G. van Wagenen and W. H. Newton.—p. 539.
Pyogenic Sepsis: Survey of 255 Cases. H. Neuhof and A. H. Aufses.—p. 544.
Manual Removal of Placenta. L. D. Odell and W. F. Hovis.—p. 553.

Coagulum Contact Method of Skin Grafting.—Sano directs attention to a new method of skin grafting. Five cc. of patient's blood is drawn into a 10 cc. syringe containing 1 mg. of heparin dissolved in 1 cc. of Tyrode's solution. The blood is centrifuged and the plasma transferred to a small 5 cc. test tube. One and five-tenths cc. of Tyrode's solution is added to the remaining red cells and buffy coat (white cells) or to the buffy coat alone if it is convenient to separate it from the erythrocytes. If the buffy coat has not been separated from the red cells, the mixture must be centrifuged and the supernatant fluid removed to another sterile tube. If the buffy coat alone is used, centrifugation is not necessary. The fluid is referred to as "cell extract." The coagulum contact method can be used for thin split grafts or full thickness grafts. The graft is turned upside down on a sterile piece of gauze. With a camel's hair brush the under side of the graft is moistened lightly with the cell extract. With another brush the plasma is painted on the recipient area. The graft is quickly fitted into the recipient area. The edges are adjusted, and slight pressure with the forceps is applied to the graft to assure good contact. It adheres within a few minutes. A single strip of boric acid gauze is lightly placed over the graft to protect it from infection and drying. No other dressings are applied; no stitches are needed. The author presents 10 cases in which this method was used.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:381-410 (Sept. 25) 1943

*Methods of Artificial Respiration. D. G. Cordier.—p. 381.
Management of Acute Pleural Empyema. P. R. Allison.—p. 383.
Ear, Nose and Throat Casualties in General Hospital in Middle East. E. G. Collins.—p. 386.
Low Spinal Anesthesia During Labor in Cases of Cardiac Failure. H. Burton.—p. 389.
Effect of Diet on Concentration of Cholesterol in Blood and Bile. Nancy Gough.—p. 390.

2:411-442 (Oct. 2) 1943

Prospect in Therapeutics. H. Dale.—p. 411.
Cutaneous and Conjunctival Diphtheria: Series of Cases. H. C. M. Williams.—p. 416.
Acute Aleukemic Myeloid Leukemia. B. L. Della Vida and M. C. Connell.—p. 417.
Dietary Factor in Reproduction and Lactation. M. B. Richards.—p. 418.
Metallic Internal Fixation of Fractures in Air Crew Cases. N. Vere-Hodge.—p. 419.
Medical Service and Social Change: Some Reflections and Convictions. Dawson of Penn.—p. 429.

Artificial Respiration.—All methods of artificial respiration must (1) give sufficient pulmonary ventilation, (2) stimulate the heart and circulation to help respiratory exchanges and transport of oxygen to tissues and (3) be harmless, easy of execution and rapid in attaining results. The physiologic efficiency of the methods can be tested by (1) determining the pulmonary ventilation and respiratory exchange, (2) radioscopic and radiographic control, (3) finding the manometric values of cardiac pressures during inspiration and expiration and (4) controlling blood movement in the circulatory system. All experimenters agree that Silvester's method introduces in the respiratory tract of the apparently dead subject the biggest volume of air. However, determination of ventilation is only one criterion in judging the efficiency. The choice of the method depends also on the causes of asphyxia. In Eve's method the patient lies on a rocking stretcher; the weight of the abdominal contents pushes the diaphragm alternately up and down. Eve believed that this movement of the diaphragm was sufficient to ensure pulmonary ventilation of normal value. Eve's rocking method has great practical advantages, but the experimental criteria employed to study its physiologic efficiency seems insufficient to prove its superiority over other methods of artificial respiration.

2:443-472 (Oct. 9) 1943

*Infectious Mononucleosis, with an Account of Epidemic in an Emergency Medical Service Hospital. J. P. A. Halcrow, L. M. Owen and N. O. Rodger.—p. 443.
New Approach to Treatment of Early Syphilis by Intensive Therapy. T. R. L. Jones and F. G. Maitland.—p. 448.
Assessment of Level of Nutrition: Revised Procedure for Estimation of Aneurin in Urine by Thiochrome Test. Y. L. Wang and L. J. Harris.—p. 451.
Local Oral Medication with Sulfanilamide in Lozenge Form. P. Garson.—p. 452.
Hypochromic Anemia in Adolescent Males. M. L. Thomson.—p. 454.

Infectious Mononucleosis.—Halcrow and his associates point out that Paul and Bunnell discovered in 1932 that the serum of patients with infectious mononucleosis contains an antibody which agglutinates sheep's red cells in high dilution and so did much to establish it as a separate entity. The disease may vary in severity from symptoms so mild as to pass unrecognized to an acute illness with severe sore throat, glandular enlargement and pyrexia, followed by a long period of debility and frequent exacerbations. The clinical manifestations are protean, and diagnosis on clinical grounds alone may be almost impossible; examination of a blood smear and a Paul-Bunnell test, however, will confirm the diagnosis. The authors observed in an Emergency Medical Service Hospital in August 1942 an epidemic of infectious mononucleosis presenting some unusual features. It was apparently widespread in surrounding districts. The unusual features in this epidemic were (*a*) a high percentage of infected persons in the adult population, (*b*) the occurrence of cases with hematologic and serologic findings and no clinical manifestations and (*c*) the fact that blood and serologic changes may precede clinical manifestations. The treatment was symptomatic. Two anginose patients were given sulfapyridine, but no favorable response was obtained. As the granulocytes are reduced in infectious mononucleosis and many show toxic changes, it is not surprising that sulfonamides do not give good results.

Lancet, London

2:401-432 (Oct. 2) 1943

Medicine and Community: Task of Statesmanship. Speech to British Medical Association. Dawson of Penn.—p. 401.
*Pathology of Acute Hepatitis: Aspiration Biopsy Studies of Epidemic, Arsenotherapy and Serum Jaundice. J. H. Dible, J. McMichael and S. P. V. Sherlock.—p. 402.
Burns Treated with Viacutan: Special Reference to Face and Hands. F. Pick and D. Barton.—p. 408.
*Thrombocytopenic Purpura. H. Evans and K. M. A. Perry.—p. 410.
Two Complications with Trichlorethylene Anesthesia. M. W. Goldschmidt.—p. 414.

Aspiration Biopsy in Acute Hepatitis.—Dible and his associates performed biopsies on the livers of 14 patients with epidemic hepatitis, of 35 with jaundice resulting from arsenotherapy, of some with hepatitis resulting from the inoculation of mumps convalescent serum and of 2 in whom jaundice followed serum transfusion. The technic they used was essentially like that described by Iversen and Roholm of Denmark in 1939. They illustrate degrees of liver damage by reference to typical cases. The inflammatory lesions may be diffuse, zonal or mixed. Jaundice persisting over two weeks is more likely to be due to a zonal lesion. Diffuse hepatitis usually heals completely and rapidly. When the disease runs a longer course some residual fibrosis in the portal zones may still be present after apparent clinical cure. The authors found no evidence that there is a form of jaundice due to duodenal catarrh and obstruction of the common bile duct by mucus. The process of development of acute and subacute necrosis and cirrhosis was followed. Histologic criteria were not found for the differentiation of the lesions resulting from epidemic hepatitis, arsenotherapy and serum inoculations.

Thrombocytopenic Purpura.—Evans and Perry studied 75 cases of thrombocytopenic purpura at the London hospital between 1927 and 1938. Thirty of the patients were of the prepuberal age. These were equally divided between the sexes; 10 of them recovered spontaneously, splenectomy was successful in 5 males and unsuccessful in 4 females, and the mortality during the period of observation was 16 per cent. Of the 45 patients who were affected after puberty, 38 were women. Only 1 female made a spontaneous recovery; splenectomy was successful in 2 males and in 7 out of 13 females, and the mortality during the period of observation was 40 per cent. Half of the deaths were due to subdural hemorrhage. In the whole series splenectomy was successful in 7 out of 7 males and in 7 out of 17 females; there were 3 operative deaths; splenectomy may be a life saving measure and is sometimes advisable in the hope of preventing subdural hemorrhage. One patient showed a striking improvement during pregnancy. Thyrotoxicosis was associated with the purpura in 4 cases.

Medical Journal of Australia, Sydney

2:201-220 (Sept. 11) 1943

*Congenital Defects in Infants Following Infectious Diseases During Pregnancy, with Special Reference to Relationship Between German Measles and Cataract, Deafmutism, Heart Disease and Microcephaly, and to Period of Pregnancy in which Occurrence of Rubella is Followed by Congenital Abnormalities. C. Swan, A. L. Tostevin, B. Moore, Helen Mayo and G. H. B. Black.—p. 201.
Lagrange Operation for Glaucoma. E. T. Smith.—p. 211.
Outbreak of Food Poisoning Due to Staphylococci. W. J. Scott and D. F. Stewart.—p. 211.

Congenital Defects in Infants Following Infectious Diseases During Pregnancy.—Swan and his associates point out that Gregg in 1941 reported 78 cases of congenital cataract. With few exceptions the mothers of these infants had suffered during the early stages of pregnancy from an exanthematous disease diagnosed as rubella (German measles). Many of the

babies were of small size, ill nourished and often difficult to feed. In 44 of them a congenital lesion of the heart was detected. The cataracts were of the dense nuclear type; they were bilateral in 62 and unilateral in the remainder. In 11 of the 16 monocular patients the affected eye was microphthalmic. The authors decided to investigate this problem in South Australia. A circular letter embodying the main facts of Gregg's paper and inviting cooperation in the investigation was sent to all medical practitioners in the state. When children, whether suffering from congenital abnormalities or not, had been born of mothers who had suffered from acute exanthems during pregnancy, it was asked that the questionnaire be filled in. Whenever practicable, permission was requested to interview the mother with regard to her illness during pregnancy and to submit the baby to examination. Of 61 infants examined, 35 were found to have congenital defects. The mothers of 49 infants had suffered during pregnancy from rubella, 4 had no knowledge of any exanthem during this time, 9 contracted measles during pregnancy and 2 suffered from mumps. In the cases of rubella during pregnancy, 31 of the infants born subsequently exhibited congenital defects. The abnormalities included cataract, deafmutism, heart disease, microcephaly and mental retardation. With two exceptions all of the 31 mothers with congenitally defective children had contracted rubella within the first three months of pregnancy. Four cases of congenital cataract are described, in some instances associated with other defects; the mothers denied all knowledge of an exanthem during pregnancy. No congenitally defective babies were born subsequent to the occurrence of measles in pregnancy. Congenital corneal opacity appeared following mumps in pregnancy.

Medicina, Buenos Aires

3:387-518 (July) 1943. Partial Index

*Electrocardiograms in 30 Cases of Wounds of Heart and of Pericardium. L. Herve and A. Forero Sarabia.—p. 387.
Hydatidosis and Pulmonary Tuberculosis. M. M. Brea.—p. 424.

Electrocardiograms in Wounds of Heart and of Pericardium.—Herve and Forero Sarabia studied electrocardiographic changes of 30 persons who were operated on for wounds of the heart or the pericardium. The electrocardiographic alterations which appear in the course of the first two weeks after a surgical operation are similar to those seen in acute pericarditis. They are caused by pericarditis or a hemopericardium which is always present in these cases. The electrocardiographic changes which depend on the myocardial lesion, namely inversion of the T_1, T_2 and T_4 waves in wounds of the left ventricle and of the T_3, T_4 and sometimes T_1 waves in wounds of the right ventricle, appear after subsidence of pericardial inflammation. An early diagnosis of the site of the wound in the heart is possible (1) before the development of pericarditis if hemopericardium does not exist and (2) when the bundle of His is injured, which is a rare occurrence. Signs of localization of wounds are more frequent, more accentuated and of longer duration in the case of wounds of the left ventricle than when the wound is in the right ventricle. Transient changes of the P wave of the type of those observed in pericarditis in the ventricular complex are frequently observed in auricular wounds. The little certainty that exists in localizing exactly the myocardial lesion during the operation is the probable cause of the occasional discrepancy between the clinical data and the electrocardiogram. The latter has no prognostic value in wounds of the heart and of the pericardium.

Medicina Española, Valencia

6:623-752 (June) 1943. Partial Index

*Lymphogranulomatous Appendicitis: Case. F. Martin Lagos.—p. 623.
Arterial Blood Pressure in Hyperfunction and Hypofunction of Adrenals. M. Schachter.—p. 659.

Lymphogranulomatous Appendicitis.—According to Martin Lagos lymphogranulomatous appendicitis is extremely rare. The case reported is the third in the medical literature. The author's patient complained of recurrent abdominal attacks, loss of weight, lack of appetite and rheumatic pains. He also gave a history of a chancre and inguinal adenopathy four years previously. These lesions disappeared spontaneously. The Wassermann test was negative. The removed appendix was entirely sclerotic. The cecum and ileum were normal. The abdominal incision developed repeated infections. The Frei test was positive. Repeated administration of sulfanilamide failed to control the infection. Roentgen therapy was effective in controlling the infection. Sulfanilamide or lymphogranulomatous antigen is indicated in the early stage of adenopathy in cases in which the Frei test is positive. The test is also indicated in recurrent infection of the appendectomy wound. A positive test in such cases is an indication for roentgen therapy.

Archiv für klinische Chirurgie, Berlin

200:159-342 (June 15) 1942

*Experiences with Surgical Therapy of Rectal Cancer: 407 Cases Observed Between 1926 and 1940. R. von Oppolzer and L. Nitsche.—p. 159.
Comparison of Simple Methods for Testing Circulation Before Surgical Interventions. L. Zeus.—p. 206.
Blood Sugar and Circulation: Comparative Studies in Artificially Increased Intracranial Pressure. H. Bierhaus.—p. 231.
*Experimental Investigations on Causes of Centrogenic Hypertension in Intracranial Increase in Pressure. H. Bierhaus.—p. 257.
Arch Fractures of Second Cervical Vertebra. F. Jimeno-Vidal.—p. 291.
Traumatic Intracranial Hemorrhages. F. Jaeger.—p. 304.
Significance of Spina Bifida Occulta for Hereditary Anlage to Labiomaxilloplatine Cleft. C. H. Schröder and H. J. Hillenbrand.—p. 328.

Surgical Therapy of Rectal Cancer.—Von Oppolzer and Nitsche report 407 cases of rectal cancer that were seen at the First Surgical Clinic of Vienna during the years 1926 to 1940. Radical operation was carried out in 51.3 per cent of the cases and colostomy in 30.2 per cent. Operation was not done in 17.1 per cent. Grouping the patients according to 5 year periods reveals increasing frequency of radical operations in recent years. In every age group about the same percentage of patients could be subjected to radical operation. The location of the tumor had no influence on the incidence of radical operation. The 209 radical operations included 105 sacral extirpations, 63 sacral resections, 37 combined operations and 4 abdominal resections. The mortality of all radical operations amounted to 19.5 per cent; with the sacral methods it was 13 per cent and with the combined methods 45 per cent. Sacral extirpation had a mortailty of 17 per cent and sacral resection one of 6.3 per cent. The mortality rates decreased as time advanced. During the last five years the total mortality of radical operations was 11.2 per cent and no fatality resulted in 36 sacral resections; the mortality of the combined operations was 20 per cent. Peritonitis, phlegmon and sepsis, pneumonia and metastases were the chief causes of death after radical operation. Metastases were already present and caused death in 20 per cent of the patients subjected to radical operation. The lower the tumor was located, the higher was the incidence of recurrences. After five years there were practically no recurrences. Young patients are more subject to recurrences than older patients. Examination of the lymph nodes of the resected specimen is of great importance for the prognosis. The survival of patients who underwent radical surgery was 33 per cent at the end of three years, 19 per cent at the end of five years and 16 per cent at the end of ten years. With regard to all operations the survival was 20 per cent at the end of three and 12 per cent at the end of five years. Colostomy, which was done in 30 per cent of the cases, had a mortality of 20 per cent, and only 2.3 per cent survived at the end of three years.

Hypertension During Intracranial Pressure Increase.—Bierhaus states that intracranial traumatic hemorrhage causes in addition to the local irritation changes in peripheral parts of the organism. Effects on the respiration and the circulation are of the greatest importance. The author studied these changes in dogs, utilizing the sphygmographic method of Frank and Broemser. The effect of trepanation and of increased intracranial pressure was thus determined. The centrogenic hypertension which develops subsequent to intracranial pressure is mild at first but later becomes more pronounced. This hypertension is caused by a great increase in the elastic resistance at the termination of the arterial system, while at the same time there is a decrease in the beat and minute volumes and the pulse frequency. Thus there is not only a peripheral resistance hypertension but also an elasticity hypertension. Not only the vagus but also the vasomotor center is irritated. In a second experiment the action of various pressure increases in

the cranium was ascertained. A noticeable failure of the circulation was evident at the beginning of a third experiment, but following intramuscular injection of synephrin tartrate there was an increase in blood pressure. In subsequent experiments the vagus was cut on both sides, then the vagus and the sympathetic were cut and finally all nervous influences were eliminated. Studies were also made on the action of vasopressin, acetylcholine and epinephrine. The author concludes that in the presence of an intracranial increase in pressure there results not only an irritation of the sympathetic centers but also a flooding out of vasopressin into the blood stream. A peripheral resistance hypertension and an elasticity hypertension are produced in this manner.

Münchener medizinische Wochenschrift, Munich

89:415-436 (May 8) 1942. Partial Index

Use of Electric Current in Diagnosis and Therapy of Paralysis of Muscle. O. von Schwerin.—p. 415.
*Problems of Diphtheria with Special Reference to Active Immunization. K. W. Clauberg.—p. 418.
New Method of Testing of Superacidity Drugs. R. Müller, K. Edelmann and K. Kühn.—p. 423.
Diagnostic Considerations with Regard to Extravasation into Knee Joint. W. Beyer.—p. 426.

Diphtheria Problem.—Clauberg's experiences with 817 carriers of diphtheria bacteria revealed that 72 days was the average carrier period of bacillus of gravis type, 86 days for bacillus of intermediate type and 19 days for the bacillus of mitis type. Statistics show that with regard to incidence and mortality the relation of individuals actively immunized to those not immunized is as 1 to 4.7 and as 1 to 8.6 respectively. Therefore mass immunization on a large scale is warranted in threatened areas. The obligatory active immunization of all children who are to be sent to recreation centers or to other countries is required by the decree of the board of health. In Berlin, general active immunization of all school children from 6 to 14 years of age is under way. The new immunization serums are built up with toxoid.

Wiener klinische Wochenschrift, Vienna

55:261-280 (April 3) 1942. Partial Index

Cancer of Larynx. H. Maruchik.—p. 261.
Arterialization of Blood as Therapy. E. Hamberger.—p. 268.
Biochemistry of Bile in Different Stages of Age. D. Kotsovsky. —p. 269.
*Pathogenesis and Corpus Luteum Treatment of Essential Thrombopenia. R. Stöger.—p. 270.

Corpus Luteum Treatment of Essential Thrombopenia.—Stöger believes that the bleeding tendency in purpura hemorrhagica may be caused by functional disturbance of the capillary system and by latent insufficiency of bone marrow involving particularly the blood platelets. The spleen may be responsible for both. A definite bleeding tendency exists at the time of menstruation, which may be due to corpus luteum hormone deficiency or to ovarian dysfunction in young girls and to the absence of corpus luteum hormone in women at the menopause. Two tablets of 10 mg. proluton C (a compound closely related to progesterone) were given orally three times a day in three cases of essential thrombopenia, one of them a case of recurrence six weeks after a splenectomy. Hemorrhages became less severe or were temporarily arrested in all cases. Increase in blood platelets could be demonstrated in only one case.

Zentralblatt für Chirurgie, Leipzig

69:849-896 (May 23) 1942. Partial Index

Snapping of Tendons of Anserinus Tract or of Its Individual Tendons (Sartorius, Gracilis, Semitendinosus). C. Henschen.—p. 850.
*Cure of Erysipelas by Azosulfamide. W. Tonndorf.—p. 857.
*Gas Gangrene and Its Treatment During Present War. V. Tuchel and J. Curcumeli.—p. 861.
Diathermy Knife in Treatment of Gas Edema. B. Tóth.—p. 864.
*Spontaneous Hypoglycemia. W. Beckert and E. Wachs.—p. 870.

Azosulfamide for Erysipelas.—Tonndorf's observations were made at an otorhinolaryngologic clinic, so that with few exceptions the erysipelas involved the head. His experience with azosulfamide dates back to 1936 and covers 125 cases, of which 122 healed promptly. The daily dose was two tablets three times daily for adults, while children received one half of this. It was found advisable to continue the medication for some time after the fever had subsided, because relapses were occasionally seen when the medication was broken off early. The azosulfamide at present is given for ten days, although the fever generally subsides in two days. The fall in temperature is accompanied by improvement in the general condition. The 3 patients with erysipelas who were not benefited by the azosulfamide received the drug previously. The effect of azosulfamide on erysipelas is so prompt that a differential diagnosis can be based on it. If the temperature does not fall promptly, the presence of other processes such as thrombophlebitis, mastoiditis, deep abscesses or phlegmons must be suspected.

Treatment of Gas Gangrene.—Tuchel and Curcumeli encountered 20 cases of gas gangrene among 2,500 wounded (0.8 per cent). During the first world war the incidence was 2 per cent. Thorough surgical treatment of the wounds (wide opening, excision of all suspected tissue, removal of foreign bodies), rapid transport to base surgical hospitals, the use of antiseptics and intravenous antigangrenous serotherapy are mainly to be credited for the reduced incidence. The authors place particular emphasis on the intravenous administration of antigangrenous serum. They now administer it exclusively by the intravenous route, after the treatment of the wound. With this treatment amputation was necessary in only 7 of the 20 cases. The serum was injected in doses of 50 cc. twice daily. These injections were continued for five days. Injection was performed as slowly as possible; patients in shock were first given intramuscular injection of 1 mg. of epinephrine. The serum injections were not followed by cardiac disturbances or by intensification of the shock. In 1 instance serum disease developed on the seventh day, but without serious results. The intravenous serotherapy of gas gangrene is a valuable addition to the surgical treatment and will reduce not only the mortality but also amputations.

Spontaneous Hypoglycemia.—Beckert and Wachs show that primary spontaneous hypoglycemia or hyperinsulinism may be produced by pancreatic disorders such as adenoma (rarely carcinoma) of the islands of Langerhans, an increase in these islands or pancreatitis or pancreatic necrosis. Secondary spontaneous hypoglycemia results from hypofunction of such endocrine organs as the adrenals, the thyroid or the anterior pituitary or from pluriglandular insufficiency. It also occurs in connection with disorders of the stomach, duodenum, liver, biliary passages and the brain, in progressive muscular atrophy and in focal sepsis. It may be brought on by irregular meals, one sided diet, hunger, glycogen storage disease and the like. All these disorders cause either increased production of insulin or deficient counter regulation and thus produce a disturbance in the carbohydrate metabolism. The exact diagnosis of spontaneous hypoglycemia requires various functional tests such as repeated determinations of the fasting blood sugar, blood sugar curves over a whole day with ordinary diet and a diet free from carbohydrates, eventually combined with work tests; blood sugar determinations following alimentary dextrose tolerance tests, injection of epinephrine and of insulin, also examination of the endocrine function of the pancreas. The differential diagnosis of primary and secondary spontaneous hypoglycemia may be difficult. The history, the general status and the existing disorders (endocrine and gastrointestinal) must be considered. Primary spontaneous hypoglycemia is usually severe and has a tendency to exacerbation, whereas secondary hypoglycemia causes only mild, sympathetic disturbances. The tolerance tests serve further clarification, but they may fail occasionally. The authors present an illustrative case of primary spontaneous hypoglycemia that was brought on by adenoma of the island cells. The treatment of hypoglycemia is at first symptomatic, consisting of a diet high in carbohydrate and fat content, but the underlying cause must be determined and treated. Primary hypoglycemia may require surgical treatment. In case of solitary adenoma of the pancreas, complete cure is possible by operation.

Book Notices

Peripheral Vascular Diseases (Angiology). By Saul S. Samuels, A.M., M.D., Consulting Vascular Surgeon, Long Beach Hospital, Long Beach, New York. Oxford Medical Outline Series. Cloth. Price, $2. Pp. 84. New York, London & Toronto: Oxford University Press, 1943.

The author offers a brief outline of peripheral vascular diseases, divided into nineteen chapters. Each chapter is followed by a representative list of references. There are no illustrations, although the anatomy of the peripheral vessels and the anatomy of the autonomic nervous system could have been greatly elucidated by a few simple line drawings. The anatomy of the vascular tree is a purely descriptive enumeration of branches without any attempt to establish patterns of collateral circulation in the case when the main pathways are obstructed. The autonomic nervous system also receives a simple enumeration; a diagram would be very useful. The author does not regard the histamine flare, the saline wheal, the intermittent hyperemia, suction and pressure, and sympathetic denervation as being of much value. Papaverine is a "theoretical vasodilator"; deep venous thrombosis of the lower leg is not mentioned as a clinical entity. Paravertebral sympathetic block as a diagnostic and therapeutic measure is not described. It is difficult to see for whom this outline is written; for the medical student it is too subjective and incomplete, for the general practitioner it does not give enough detail, for the specialist there is here and there a pithy aphorism which reflects the vast clinical experience of the author hidden under the dogmatic statements of the outline. The physical makeup of the handy volume is excellent.

The Dispensatory of the United States of America. By Horatio C. Wood Jr., M.D., Ph.M., Professor of Therapeutics in the University of Pennsylvania, Philadelphia, and Arthur Osol, Ph.G., M.S., Ph.D., Professor of Analytical and Physical Chemistry and Director of the Chemical Laboratories in the Philadelphia College of Pharmacy and Science, assisted by Heber W. Youngken, Ph.M., Ph.D., Sc.D., Professor of Pharmacognosy and Biology in the Massachusetts College of Pharmacy, Boston, and Louis Gershenfeld, B.Sc., Ph.M., D.Sc., Professor of Bacteriology and Hygiene and Director of the Laboratories of Bacteriology and Clinical Chemistry in the Philadelphia College of Pharmacy and Science. Based on the Twelfth Revision of The United States Pharmacopoeia, The National Formulary Seventh Edition, and the British Pharmacopoeia 1932 and its Addenda. Twenty-Third edition. Cloth. Price, $15. Pp. 1,681. Philadelphia, London & Montreal: J. B. Lippincott Company, 1943.

A review of the twenty-third edition of the Dispensatory of the United States of America should be preceded by congratulations to the editors. Long known and widely used for the mass of information which it contains, this book has been available for a hundred and ten years through twenty-three editions, the first being published in 1833. Seven years have elapsed since the twenty-second edition was issued, and many changes have occurred in our knowledge of drugs. The twenty-third edition takes full cognizance of these changes. While the general plan remains the same, the contents include new articles on the glycosides, alkaloids, sterids, amino acids and surface acting agents and revisions to recognize U. S. P. XII (up to Feb. 1, 1943), National Formulary VII (up to Feb. 1, 1943), British Pharmacopeia and its five addenda, and New and Nonofficial Remedies. Many other revisions have been made, and it is not surprising to note that the index includes more than thirty thousand entries. The contents are divided into an explanatory introduction, list of abbreviations, descriptions of drugs recognized by the United States Pharmacopeia, the Pharmacopeia of Great Britain and the National Formulary; descriptions of drugs not recognized in these official compendiums; descriptions of processes, reagents, solutions and tables of the United States Pharmacopeia and the National Formulary, and general index. No description of this book is necessary for those acquainted with its pages; an adequate description is impossible in a review for those who do not possess this familiarity. It seems sufficient to say that the twenty-third edition of the Dispensatory provides an up to date encyclopedic source of information which is not available elsewhere between the covers of one book. It is essential to most libraries of those interested in drugs, a valuable addition to any library if the owner wishes an authentic work of reference.

Contemporary Psychopathology: A Source Book. Edited by Silvan S. Tomkins, Ph.D., Instructor in Psychology, Harvard University, Cambridge. With an introduction by Henry A. Murray, M.D., Ph.D., Director of the Harvard Psychological Clinic. Cloth. Price, $5. Pp. 600, with illustrations. Cambridge: Harvard University Press, 1943.

This book represents a successful and valuable compilation of contemporary studies in psychopathology. Contributions to the literature by fifty-four different authors are printed in full without comment. The reader is free to form his own judgments. Material is presented relative to problems of childhood, psychoneuroses, schizophrenic psychoses, psychosomatic medicine and experimental psychopathology. It is evident that careful thought was given to the choice of each paper included. The editor has wisely chosen those contributions which stress the dynamic approach to problems of human behavior. While there are many more excellent contributions in the literature to all the fields covered, the editor had to choose those which he considered representative. It might have been advisable to include a recommended list for further reference either at the end of each chapter or as an index, but this is a minor criticism. Although, as the editor states, "This volume is designed for courses in abnormal psychology," it is unreservedly recommended to all students of psychology and psychiatry. As a reference book it is unequaled.

Nurses Handbook of Obstetrics. By Louise Zabriskie, R.N., Director Maternity Consultation Service, New York City, and Nicholson J. Eastman, M.D., Professor of Obstetrics in Johns Hopkins University, Baltimore. Seventh edition. Cloth. Price, $3.25. Pp. 714, with 276 illustrations. Philadelphia, London & Montreal: J. B. Lippincott Company, 1943.

The present book is a distinct advance over the previous editions. In place of the fourteen men and women who contributed sections in the last edition, Eastman is the sole co-author except for the chapter of the history of obstetrics. In recent years the trend in the preparation of textbooks for nurses has been for the collaboration of a physician and a nurse, and the great value of such teamwork is manifest in this book, for Eastman has done his part admirably. The book has been almost completely rewritten, reillustrated and reset. Many of the useless data contained in the sixth edition have been omitted. The information presented is highly practical, and emphasis has been laid on public health nursing in obstetrics. The illustrations are abundant and highly instructive. At the end of each chapter is a small but select list of books and articles for suggested reading. Throughout the book are helpful "self-evaluation tests." The publishers have done their part well. The book is much more compact than the last edition, and the type and illustrations are clear. All in all the book is a valuable asset for nurses and it should be widely used.

Bases para la organización de un hospital general. Por los doctores Pedro L. Fariñas, Jefe del Servicio central de rayos X del Hospital nacional "General Calixto García," Alfredo Antonetti, Profesor titular de tuberculosis de la Facultad de medicina de la Universidad de la Habana, y Víctor Santamarina, Instructor de la Cátedra de patología y clínica infantiles de la Facultad de medicina de la Habana. Paper. Pp. 333. Habana: Cultural, S. A., 1943.

This book is a well organized outline of the fundamentals of hospital organization based on the minimum requirements and standards recommended by the American College of Surgeons and by the Council on Medical Education and Hospitals of the American Medical Association. The fifteen sections include the organization of the administrative and medical staffs, board of directors, hospital personnel, dietetic department and library and give the main lines for the routine work of the medical, surgical and pathologic divisions and laboratories.

A List of Schools of Nursing Meeting Minimum Requirements Set by Law and Board Rules in the Various States and Territories. Compiled by Department of Studies, National League of Nursing Education. Correct to January 1, 1943. Paper. Price, $2.25. Pp. 30. New York, 1943.

This 1943 list gives information similar to that of previous years. In addition, it gives the average daily number of patients and shows also the increased enrolment in schools of nursing. The list serves as a useful handbook for the type of information about schools of nursing that lends itself to statistical reporting. It contains the names of 1,297 schools of nursing in the United States and 11 in Hawaii and Puerto Rico that were approved by the various state and district boards of nurse examiners on Jan. 1, 1943.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

REPEATED INTESTINAL INTUSSUSCEPTION

To the Editor:—Have you any knowledge of any form of postoperative treatment which has proved of value in preventing recurrence of intestinal intussusception? A 29 months old boy has had three attacks of intussusception, at 13 months, 21 months and 28 months. Each attack necessitated laparotomy and reduction. No abnormalities or anomalies of the bowel were found. Fear that there may be further attacks leads me to make this inquiry.

M.D., New Jersey.

ANSWER.—Because of the rarity of the condition and the fact that no abnormalities and anomalies were found, operation in this case is inadvisable, especially as intussusception tends to become extinct as age progresses. In general most authors feel that any type of operation to prevent a future intussusception is inadvisable because: 1. Although 80 per cent of the intussusceptions are in the region of the ileocecal valve, there is no assurance that future intussusception will occur in that region rather than in other parts of the bowel. 2. All operations which have been devised for this condition entail a suturing of the large bowel to the parietal peritoneum or to the ileum, and it is thought that this suturing of the large bowel definitely predisposes to infection. 3. The condition is so rare that it is better to run the risk of recurrence rather than the danger of possible infection. As no operation is known at present which will definitely prevent a recurrence of intestinal intussusception, surgery is contraindicated.

FRESH HEMORRHAGE FROM BOWEL AFTER TONSILLECTOMY

To the Editor:—A boy aged 16 had his tonsils removed locally under 2 per cent procaine hydrochloride with no preoperative medication. Postoperative bleeding was minimal and stopped completely within thirty minutes after operation. The patient was allowed to go home in another hour. About four hours postoperatively he began losing bright red blood from the bowel; no cause could be found. I am at a complete loss to explain this either than as a coincidental phenomenon. There is a history, however, of the boy's having packed cascara bark in a dusty warehouse the day preceding the operation; however, he suffered no immediate ill effects from this contact. I should like an opinion as to the possible relation of the bleeding to the operation and also the contact with cascara bark.

M.D., Oregon.

ANSWER.—It is impossible to give a categorical answer to this query, but it can be reasonably certain that the loss of bright red blood from the bowel was not due to post-tonsillectomy bleeding, for, as stated, the bleeding stopped completely within thirty minutes, and as this was a local tonsillectomy with normal pharyngeal and laryngeal reflexes it is not likely that the patient swallowed any blood. Let us assume, however, that the patient might have bled a little from one or both tonsillar fossae and in the reclining position in bed swallowed some blood. This blood would have to pass through the stomach and intestine and would appear definitely altered in the stool; that is, it could not be bright red because of the numerous chemical changes.

The inquirer also tells us that "no cause could be found" when the patient began passing bright red blood from the bowel four hours postoperatively, so that one is at a loss to explain the passing of bright red blood by bowel.

The contact with cascara bark would have no relation to the bleeding by bowel, for the bark would have to be ingested to induce purgation and intestinal action.

A complete proctologic survey should be made to rule out fissures, internal hemorrhoids, ulceration and kindred structural changes as well as to make a painstaking recheck of the history of any symptoms of dysfunction of the sigmoid, rectum and anus.

If these studies should fail to locate a lesion, the patient should be watched and thoroughly examined at the first moment that bleeding by bowel is reported, for, as is well known, a patient may bleed from the bowel but the proctologist may not be able to locate the source of the bleeding after the latter has stopped, just as the rhinologist often is unable to locate the source of nasal bleeding after the epistaxis has been controlled or has spontaneously ceased.

DETERMINATION OF BLOOD pH

To the Editor:—It would assist me greatly if I knew the best method and commercial apparatus for the determination of blood p_H. The textbooks in biochemistry teach me that the blood p_H can be determined by expired air, urine and blood. I should prefer a respiratory method as a matter of convenience. However, I would sacrifice any objection for reliability. Any information and direction to literature will be of tremendous help.

Richard J. Wehs, M.D., Louisville, Ky.

ANSWER.—A reliable method for estimating the plasma p_H is the colorimetric procedure of G. E. Cullen (*J. Biol. Chem.* **52**:507 [June] 1922.

Principle.—Whole blood is oxalated and centrifuged under oil. The plasma is added to isotonic solution of sodium chloride containing the phenol red indicator and compared with standards of known p_H values.

Reagents.—1. Sodium chloride 0.9 per cent in water.

2. Phenol red solution 0.03 per cent in water. To 0.030 Gm. of phenol red in a glass mortar add 0.86 cc. of hundredth normal sodium hydroxide and distilled water. Grind until dissolved. Dilute to 100 cc. with distilled water.

3. Phosphate buffer solutions of known p_H values.

(*a*) Fifth molar dihydrogen potassium phosphate. Use the highest reagent grade and dry at 110-115 C. to constant weight. Dissolve 27.232 Gm. of the dry salt in good distilled water and dilute to 1,000 cc.

(*b*) Fifth molar sodium hydroxide. Take 200 cc. of accurately standardized carbonate free N-NaOH and dilute to 1,000 cc. with recently boiled water.

Make the following dilutions in 200 cc. volumetric flasks. Use recently boiled water for the dilutions:

p_H	M/5 KH_2PO_4 Cc.	M/5 NaOH Cc.	Dilute to Cc.
6.8	50	23.60	200
7.0	50	29.54	200
7.2	50	34.90	200
7.4	50	39.34	200
7.6	50	42.74	200

4. Hundredth normal sodium hydroxide.

Procedure.—The blood is drawn under liquid petrolatum and oxalated. It is transferred to a small centrifuge tube with a layer of liquid petrolatum over the blood sufficient to fill the tube. Stopper with a one hole rubber stopper in such manner that no air remains in the tube and that the excess oil being replaced by the stopper is forced out through the hole in the stopper. Then stopper the hole in the stopper with a tightly fitting glass rod. Centrifuge until a good separation of the corpuscles has been accomplished.

Select Pyrex test tubes of the same diameter (15-16 mm. inside) and color. Measure 20 cc. quantities of the standard buffers of p_H values 7.0, 7.2 and 7.4 into separate tubes, add liquid petrolatum to prevent absorption of carbon dioxide and 7 drops of the 0.03 per cent phenol red. Mix each well with a fine stirring rod. These are standards to be compared with the unknowns in a comparator block.

Prepare the unknowns as follows: To 100 cc. of a freshly prepared 0.9 per cent sodium chloride solution in a 100 cc. cylinder add liquid petrolatum to make a ¼-½ inch layer. Add 35 drops of the 0.03 per cent phenol red solution and then very cautiously hundredth normal sodium hydroxide until the color corresponds to the p_H 7.4 standard. Stir with a fine glass rod. Transfer 20 cc. to one of the test tubes and cover with liquid petrolatum. To this deliver under the oil 1 cc. of the blood plasma and mix with the fine glass rod. This is tube C.

To a fourth tube (D) transfer 20 cc. of the 0.9 per cent sodium chloride solution plus liquid petrolatum but no phenol red. To this also add 1 cc. of the blood plasma in the same way. Stir well with a fine glass rod.

For comparison in the comparator place the standard tube in front of tube D and tube C in front of a tube containing 20 cc. of 0.9 per cent sodium chloride plus liquid petrolatum. Compare with different standards until the best match is found.

Note the temperature and p_H. To correct for the temperature effect calculate (0.42—0.01 t), where t is the temperature in degrees C. In case the temperature is below 38 C. subtract the value (0.42—0.01 t) from the observed p_H to obtain it for 38 C.

CARCINOGENS AND EXPERIMENTAL CARCINOMA

To the Editor:—About how long does it take to induce papillomas by daily application of benzene to the skin of a rabbit? How may carcinoma be produced in the guinea pig and mouse?

M.D., Ohio.

ANSWER.—Careful compilation of the relative carcinogenic activity of various carcinogens by Hartwell in 1941 does not give any instance of papillomas induced in rabbits by benzene.

Carcinoma may be induced in the mouse by a variety of substances. Those most frequently used are 3,4 benzpyrene, 20

methylcholanthrene and 1,2,5,6, dibenzanthracene. The shortest period after application of the carcinogen to the appearance of the tumor is about sixty days. Usually a considerably longer time is required.

Carcinoma in the guinea pig is more difficult to induce. Foulds reports 1 case following injection of thorium dioxide in the nipple region. It may also prove that estradiol will be active in producing carcinoma, according to Lipschütz.

The review of the field of carcinogens published by J. L. Hartwell, National Cancer Institute, Bethesda, Md., is recommended for detailed information.

DERMATITIS OF HANDS IN DITTO MACHINE OPERATORS

To the Editor:—After sixteen months of employment, a stenographer who also operates a ditto machine developed a subacute dermatitis of the palms, sides of the fingers and flexor surfaces of the wrists, all approximately two months ago. The eruption is blotchy or in some instances consists of small vesicles. It itches severely. Besides handling carbon paper she used a liquid supplied by the Ditto Company, Chicago, to remove stains from the fingers. She states that soaps will not remove the stains. The thought suggests itself that this liquid may be the contact factor causing her dermatitis. I should appreciate any help you may be able to supply as to the likelihood of this suspicion being true and, if possible, suggest a substitute for removing these stains from the fingers.

H. C. Miller, M.D., Racine, Wis.

ANSWER.—Dermatitis of the hands among ditto machine operators is not of infrequent occurrence. If it is occupational, the carbon paper is not the usual cause.

In an investigation of an outbreak of dermatitis among office workers (Schwartz, Louis, and Sulzberger, Marion B.: Dermatitis Among a Group of Office Workers Found Not to Be of Occupational Origin, *Pub. Health Rep.* **52**:1441 [Oct. 15] 1937) patch tests were performed on 54 persons with carbon papers of various compositions without obtaining any positive reactions. The cause of the dermatitis, if occupational, in most such cases is the cleanser used to remove the indelible dyes from the skin.

While the composition of the particular ditto remover which is mentioned is not available, such dye removers usually consist of a soap or a vanishing cream base containing a solvent such as carbitol or carbon tetrachloride. Dermatitis may well be caused by the frequent use of such a dye remover, especially if the skin is naturally thin and dry. Not only does such a dye remover tend to remove the indelible dye from the epithelium, but it also tends to remove the fatty secretions of the skin.

Many cases of dermatitis caused by ditto remover cannot be proved by patch tests, because in performing the patch test only a small amount of the remover is used, whereas under actual working conditions the skin is exposed to much greater amounts.

The indelible inks used on ditto machines consist of such dyes as methyl violet, crystal violet, various oils and solvents. In rare instances, sensitivity may be present to one or more of these ingredients.

A method suggested for the removal of indelible ink stains from the skin is to immerse the hands in a 1:1,000 solution of potassium permanganate for a minute followed by washing the hands in a 5 per cent solution of sodium bisulfite. This is to be followed by washing with soap and water to remove all traces of the reagents. In cases in which such treatment has a deleterious action on the skin, it should be followed by the use of a simple emollient cream such as equal parts of wool fat and cold cream.

ANESTHESIA FOR OPERATIONS ABOUT HEAD

To the Editor:—I am seeking information regarding the hazards of using pentothal sodium for operations about the head and neck, most particularly septic surgery, as for example sublingual abscess. Are there any contraindications to the use of pentothal in such cases? If so, what would be the anesthetic of choice?

First Lieutenant, M. C., A. U. S.

ANSWER.—Pentothal sodium is used for minor operations about the head and neck. However, it is not particularly suitable for prolonged operations unless it is combined with local anesthesia or unless an intratracheal tube has been inserted before operation has begun. For septic conditions such as sublingual abscess, peritonsillar abscess or phlegmon of the neck, pentothal sodium is not the anesthetic agent of choice. The contraindication to its use is that some pus or foreign material may gravitate to the throat and cause laryngospasm. This spasm is sometimes so severe and so prolonged that a fatal outcome is threatened. It has been suggested, by Capt. George Bradasch, M. C., A. U. S., that preliminary tracheotomy be done in these cases if pentothal is to be used.

Few persons will submit to the opening of an abscess without some anesthesia, but the hazard is so great that the following precaution should be followed if general anesthesia is to be used: The patient's head should be lowered so that the contents of the abscess will not obstruct the air passages as it drains.

Nitrous oxide and oxygen, administered by a nasal inhaler only to the point of analgesia, seems to give the safest general anesthesia for the persons here under consideration.

PROBABLE PERNICIOUS ANEMIA WITH NEURAL SYMPTOMS

To the Editor:—A man aged 53 complained of numbness and tingling in both hands and feet for the past three to six weeks. Inquiry revealed that he had had some difficulty in walking, chiefly from ataxia, which was most noticeable in the dark or when walking up or down stairs. Examination revealed hyperactive deep reflexes, bilateral positive Babinski reflex (dorsiflexion), positive Romberg sign, absent vibration sense and some difficulty in the heel, toe and finger to nose tests. It was later learned that the paresthesia actually had been present in the lower extremities up to the knees and in almost the entire upper extremities with some evidence of this in the upper chest and lower abdomen. A diagnosis of subacute combined degeneration of the spinal cord was made. There was no evidence of primary pernicious anemia in the blood, which showed a red blood cell count of 4,300,000 and hemoglobin of 80 per cent with a normal smear. He has received four injections of 500 mg. of thiamine and 40 units of a preparation containing anti-pernicious anemia principle twice weekly and then a similar amount every two weeks. There has been definite subjective improvement in that practically all his paresthesia and ataxia has disappeared. I am at a loss as to the future treatment. I intend to give him 2 cc. of the anti-pernicious anemia preparation twice a month intramuscularly. This treatment apparently should be given indefinitely, but how is one to judge the amount required in the absence of any hematologic abnormality? At the present time he has practically no complaints referable to his nervous system. There have never been any gastrointestinal complaints or feeling of weakness or dyspnea. There is no evidence of icterus in the skin or in the blood findings. The only relevant past history is that of a cholecystectomy in 1926 and pneumonia in 1942 for which he was treated with some sulfonamide drug.

M.D., Rochester, N. Y.

ANSWER.—The typical neural changes with improvement after parenteral liver therapy would seem sufficient to make a diagnosis of pernicious anemia. Further support would be given to the diagnosis by the finding of gastric anacidity following histamine stimulation. It is known that, in pernicious anemia, neural symptoms may appear before there is evidence of anemia.

The great majority of patients with pernicious anemia can be maintained in complete remission by the injection of 15 units of liver extract at intervals of two weeks. By close questioning for the recurrence of paresthesias and by a careful neurologic examination every three months, it should be possible to detect progress of the cord disease before any permanent harm is done. If progression occurs, the dose of liver extract can be increased accordingly.

DYSENTERY FROM BALANTIDIUM COLI

To the Editor:—For the last two months I have had under hospital care 2 brothers, aged 3 and 5, whose chief complaint is a severe chronic diarrhea. Repeated fresh stool examinations have revealed large amounts of Balantidium coli, and no Giardia lamblia nor Amoeba histolytica. Under a high protein, high caloric diet and iron by mouth their general condition, which was poor on admission, has greatly improved. However, the diarrhea persists, there being eight to ten liquid, foul, abundant and bloody stools per day without tenesmus. They have had chenopodium on three occasions and two courses of carbarsone, 0.1 Gm. daily, without any improvement in the diarrhea or diminution in the amount of Balantidium coli in the stools. I will appreciate information concerning treatment of this condition.

A. J. Mejía, M.D., Central Aguirre, Puerto Rico.

ANSWER.—The treatment of balantidial dysentery is notoriously unsatisfactory. Carbarsone, acetarsone, thymol and oil of chenopodium are among the drugs which have on occasion been successfully used. Strong (Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases, Philadelphia, Blakiston Company, 1943, p. 452) lists the following measures for which some merit has been claimed:

1. Enemas of organic compounds of silver, such as strong protein silver.

2. Oil of chenopodium enemas. In 12 cases in Siam 15 cc. of oil of chenopodium in 150 cc. of olive oil effectively cleared the bowel of balantidia, but 1 patient developed chemopodium poisoning when the enema was repeated within twenty-four hours.

3. One patient responded to enemas of methylene blue 1:3,000.

4. E. Silva of Brazil treated 10 patients resistant to chemotherapy but who responded symptomatically and who lost the balantidia following a regimen of 350 cc. of milk every six hours. The refractory patient subsequently responded to a proprietary preparation of acetarsone (a drug with high toxicity).

It may of course be desirable to make certain that the persisting symptoms are balantidial in causation. Sigmoidoscopy to rule out the presence of amebic ulcerations is therefore suggested.

COMPLICATIONS OF FECAL FISTULA

To the Editor:—On July 20, 1943 a 50 year old white man presented a strangulated hernia in the right groin of nine hours' duration. A soft irreplaceable mass had been present for four or five years. Three soft stools were passed after strangulation. There were mild nausea and slight epigastric discomfort. His past history included pneumonia. The patient was muscular and healthy looking with a florid face, perforated nasal septum, dark reddening of the pharynx, carious teeth, swollen gums, a soft flat abdomen, enlarged subcutaneous inguinal rings and a rounded mass 2 cm. in diameter occupying the region of the right femoral ring. This was almost hard and was not tender. It was immovable. Under field block and local infiltration of procaine and epinephrine solution the hernia was exposed. Opening the sac freed a small amount of brownish red fluid without odor. A small knuckle of bowel was caught tightly in the femoral ring. It was necessary to divide the lower part of the inguinal ligament. The proximal and distal limbs of the bowel were drawn downward through the enlarged femoral ring. A blackened area was found which on one side extended to the mesenteric attachment. An enterostomy was performed in both limbs through sound bowel, and a loop approximately 12 cm. in length was left in the open wound. The surfaces were sprinkled with sulfanilamide. On the first few days the patient had colicky epigastric pain. On the third postoperative day the exteriorized bowel was removed with a cautery. Fecal drainage through the fistula was free. At times the bowels were moved. The patient complained of epigastric pain. Excoriation of the skin about the fistula soon became a serious problem. On September 9 the patient was encouraged to walk. On stepping into the tub he suddenly felt "blind" and became conscious of sharp pains in his heart and was breathless. He appeared pale and frightened, he was breathing deeply and the blood pressure was 92/70. He soon began spitting up a small amount of blood not accompanied by sputum, and the next day there was pain and tenderness in the left lower chest. This was also associated with elevation of temperature. He continued to spit up small quantities of blood. He was extremely apprehensive. Diagnosis of pulmonary infarct was made. Diminished breath sounds and rales became apparent over the painful area. Fever and rapid pulse continued for several days, together with leukocytosis. On September 20 an acute thrombophlebitis developed in the left lower extremity, with a great deal of pain. On the following day the first four lumbar sympathetic ganglions were injected with procaine. This was soon followed by relief from pain and rapid decrease in swelling. Arterial pulsation in the foot disappeared with the onset of the thrombophlebitis, and the dorsalis pedis pulsation gradually reappeared. A bronchial pneumonia which developed over the left lower chest rapidly cleared up under the influence of sulfathiazole. Severe mental depression ensued, which is now improving. The patient finds the pain from skin excoriation almost unbearable. Zinc oxide ointment is the most relief than any other measure tried. The sedimentation time on September 28 was 20 minutes to 18 mm. and on October 27 it was 50 minutes to 18 mm. He has been practically fever free for four weeks. Anastomosis of the bowel in the near future is being contemplated in order to lessen the chances of further complications. Is heparin indicated in this case? If so, will you suggest the dosage, method of administration and sources of the drug. Any further suggestions in this case will be greatly appreciated.

Alex S. Moffett, M.D., Banner Elk, N. C.

ANSWER.—If the patient is now ambulatory, heparin need not be considered. When the fistula is being closed, heparin may be given as a prophylactic measure, 5 cc. every four hours during the day by the intravenous route. This is kept up for three to four days. The purpose is to prevent further thrombosis and embolism. For the excoriated skin, many measures have been advocated, most of which are really effective only before the irritation starts. Covering the skin adjacent to the fistula with yeast is helpful. A yeast cake is made up with batter and applied over the skin. When it dries and cracks it is removed and a fresh yeast batter is applied (Mead, C. H.: *Minnesota Med.* **16**:450 [June] 1933). A 5 per cent tannic acid ointment has also been recommended (Potter, E. B.: *Ann. Surg.* **98**:700 [May] 1932). Diversion of the fecal current into the bowel is of course the desirable solution.

NUTRIENTS IN FRUIT JUICES AND IN RESIDUE AFTER PASSAGE THROUGH JUICER

To the Editor:—Patients have frequently sought my advice concerning fruit and vegetable juices. I recently saw one of these electric vegetable juicers demonstrated and was surprised at the amount of residual pulp. I wonder if this pulp does not retain the major part of minerals and vitamins, so that the vegetable juice is more or less a watery dilution with juice aroma. Does it not seem more advisable to eat the whole vegetable, either raw or cooked, unless special dietary requirements stipulate vegetable juices?

M.D., Wisconsin.

ANSWER.—A small study has been made on the ascorbic acid, carotene, calcium and phosphorus content of vegetable juices extracted with a hand turned juicer. Extracted thus, it was found that much of the nutrients remained in the vegetables; yet, weight for weight, vegetable and juice were about equal in value.

BRONCHIECTASIS

To the Editor:—I should appreciate information on the treatment of an atypical type of bronchiectasis involving the lower lobe of the left lung. The patient lives 100 miles north of Mobile, Ala. Would a conservative treatment of high altitude be of any great benefit, say on the plains of Texas or New Mexico? This patient at times expectorates blood following coughing and is exhausted. There is no elevation of temperature. He is more or less a mouth breather. He is a cooperative patient, and I do not want to subject him to an operation unless it is necessary.

W. E. Allen, M.D., Sweet Water, Ala.

ANSWER.—An occasional patient with bronchiectasis will be benefited by residence in a dry, equable climate. Improvement is so uncertain and unlikely that patients should always be advised to try the new climate before making any permanent change of residence. At the present time unilobar bronchiectasis can be treated so safely and successfully by lobectomy that any patient having more than minimal symptoms from the disease should be advised to have the operation. The mortality from the operation is not more than 2 per cent.

INFECTIOUS MONONUCLEOSIS AND PREGNANCY

To the Editor:—A woman has shown the symptoms and signs of mononucleosis for the past eleven months. The blood picture has been characteristic and she has repeatedly shown a positive agglutination with a titer of 1:126. She wishes to become pregnant. Her general health is good. Will you please tell me what to advise her?

Alexander R. Freeman, M.D., Albany, Ga.

ANSWER.—It is exceedingly unusual for infectious mononucleosis to remain active for eleven months. Some of the symptoms of this disease, such as glandular enlargement, splenomegaly and hematologic changes, may persist for months or even years after recovery. An agglutination titer of 1:126 may be encountered in normal persons. Only agglutination titers of 1:160 or higher can be taken as significant evidence of active infectious mononucleosis. It is probable, therefore, that the active stage of infectious mononucleosis has already subsided in this patient. At any rate, when this condition is mild and uncomplicated it has no special effect on pregnancy, and prevention of the latter is not necessary.

SPINAL FLUID IN SUN STROKE

To the Editor:—What are the usual findings on examination of the spinal fluid and the average neurologic findings in (1) heat stroke and (2) heat exhaustion? What variation may one expect from first hour to twenty-four hours?

Captain, M. C., A. U. S.

ANSWER.—There have been few observations on the spinal fluid in cases of sun stroke. Steinhauser's critical review in 1910 quotes only Dopter as finding an increase of cells, suggesting a meningitis. Fleck and Hückel found a pressure of 280 mm. of water and a bloody, yellow fluid in a case of heat stroke. Straus states that the pressure is usually elevated and that polymorphonuclear cells are found in the fluid in early stages, later lymphocytes.

References:

Steinhauser, F. A.: Nervensystem und Insolation, Berlin, Hirschwald, 1910.

Dopter: Le liquide cephalo-rachidien dans le coup de chaleur, *Bull. et mém. Soc. méd. d. hôp. de Paris* **20**: 1396, 1903.

Fleck, V., and Hückel, R.: Zur Klinik und Pathologie des Hitzschlages, *Deutsche Ztschr. f. Nervenh.* **117-119**: 113, 1931.

Straus, E.: Der Hitzschlag, in Kraus and Brugsch: Spezielle Pathologie und Therapie der innere Krankheiten **10** (2): 432, 1924.

EPINEPHRINE AND CUTANEOUS SENSITIVITY TO ALLERGENS

To the Editor:—The answer to the query entitled "Possible Effects of Epinephrine and Ephedrine on Cutaneous Tests with Allergic Substances" in the Oct. 23, 1943 issue requires comment. The following statement is based on experience with this: When a new patient appears in a severe asthmatic attack, relief is first attempted with epinephrine. The attack is usually ameliorated within one-half hour, when the pollen tests are performed. Furthermore, many of these patients have been taking ephedrine and epinephrine up till the day of their visit. Notwithstanding this, the cutaneous reaction of a patient with pollinosis to the pollens is definitely positive. A small number of patients with pollinosis will not react to the cutaneous test regardless of method or concentration of antigen. I am now working with other allergens to determine whether these drugs influence the cutaneous reaction within certain times of their administration. However, since the inquirer asks about hay fever, I do not regard it as necessary to defer the pollen tests because of the use of epinephrine and ephedrine, as a cutaneous reactive pollinosis patient will definitely be positive. It is unnecessary to have a patient suffer at least twenty-four hours to ascertain a pollen diagnosis.

David L. Engelhardt, M.D., New York.

JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, SEPTEMBER-DECEMBER 1943

Titles have been listed or abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past four months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1933. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

American Heart Journal. St. Louis.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Fort Wayne, Ind.
*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. Cincinnati.
American Journal of Orthopsychiatry. New York.
American Journal of Pathology. Ann Arbor, Mich.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonor. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Review of Tuberculosis. New York.
Anales de la Cátedra de patología y clínica de la tuberculosis. Buenos Aires.
Anesthesiology. New York.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Otology, Rhinology and Laryngology. St. Louis.
Annals of Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Archiv für Gewerbepathologie und Gewerbehygiene. Berlin.
Archiv für Kinderheilkunde. Stuttgart.
Archiv für klinische Chirurgie. Berlin.
*Archives of Dermatology and Syphilology. A. M. A., Chicago.
Archives of Disease in Childhood. London.
*Archives of Internal Medicine. A. M. A., Chicago.
*Archives of Neurology and Psychiatry. A. M. A., Chicago.
*Archives of Ophthalmology. A. M. A., Chicago.
*Archives of Otolaryngology. A. M. A., Chicago.
*Archives of Pathology. A. M. A., Chicago.
Archives of Physical Therapy. Chicago.
*Archives of Surgery. A. M. A., Chicago.
Archivos argentinos de enfermedades del aparato digestivo y de la nutrición. Buenos Aires.
Archivos argentinos de pediatría. Buenos Aires.
Archivos latino americanos de cardiología y hematología. Mexico, D. F.
Archivos de Oftalmología de Buenos Aires.
Australian Journal of Experimental Biology and Medical Science. Adelaide.
Boletín de la Asociación médica de Puerto Rico. Santurce.
Boletín del Instituto de medicina experimental para el estudio y tratamiento del cáncer. Buenos Aires.
Brain. London.
British Journal of Anesthesia. Manchester.
British Journal of Children's Diseases. Dorking, England.
British Journal of Dermatology and Syphilis. London.
British Journal of Experimental Pathology. London.
British Journal of Ophthalmology. London.
British Journal of Radiology. London.
British Journal of Surgery. Bristol.
British Journal of Urology. London.
British Medical Journal. London.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the New York Academy of Medicine. New York.
Bulletin of the U. S. Army Medical Department. Washington, D. C.
California and Western Medicine. San Francisco.
Canadian Journal of Public Health. Toronto.
Canadian Medical Association Journal. Montreal.
Cancer Research. Baltimore.
Connecticut State Medical Journal. Hartford.
Delaware State Medical Journal. Wilmington.
Der deutsche Militärarzt. Berlin.
Deutsche medizinische Wochenschrift. Leipzig.
Deutsche Zeitschrift für Chirurgie. Berlin.
Diseases of Chest. Chicago.
Edinburgh Medical Journal.
Endocrinology. Springfield, Ill.
Experimental Medicine and Surgery. Brooklyn.
Gastroenterology. Baltimore.
Glasgow Medical Journal.
Guy's Hospital Reports. London.
Hawaii Medical Journal. Honolulu.
Helvetica medica acta. Basel.
Helvetica Physiologica et Pharmacologica Acta. Basel.
Illinois Medical Journal. Chicago.
Journal of Allergy. St. Louis.
Journal of the Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bone and Joint Surgery. Boston.
Journal of Clinical Endocrinology. Springfield, Ill.
Journal of Clinical Investigation. Boston.
Journal of Endocrinology. London.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Industrial Hygiene and Toxicology. Baltimore.
Journal of Infectious Diseases. Chicago.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.
Journal of Laboratory and Clinical Medicine. St. Louis.
Journal-Lancet. Minneapolis.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Lansing.
Journal of the Missouri State Medical Association. St. Louis.
Journal of the Mount Sinai Hospital. New York.
Journal of the National Cancer Institute. Washington, D. C.
Journal National Malaria Society. Tallahassee, Fla.
Journal of Nervous and Mental Disease. New York.
Journal of Neurology and Psychiatry. London.
Journal of Neuropathology and Experimental Neurology. Baltimore.
Journal of Neurophysiology. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of Obstetrics and Gynaecology of British Empire. Manchester.
Journal of the Oklahoma State Medical Association. Oklahoma City.
Journal of Pathology and Bacteriology. Edinburgh.
Journal of Pediatrics. St. Louis.
Journal of Pharmacology and Experimental Therapeutics. Baltimore.
Journal of Physiology. Cambridge.
Journal of Royal Army Medical Corps. London.
Journal of Royal Naval Medical Service. London.
Journal of the South Carolina Medical Association. Florence.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Urology. Baltimore.
Kentucky Medical Journal. Bowling Green.
Klinische Wochenschrift. Berlin.
Lancet. London.
Medical Annals of the District of Columbia. Washington.
Medical Journal of Australia. Sydney.
Medicina. Buenos Aires.
Medicina. Madrid.
Medicina. Mexico, D. F.
Medicina española. Valencia.
Medicine. Baltimore.
Medizinische Klinik. Berlin.
Military Surgeon. Washington, D. C.
Minnesota Medicine. St. Paul.
Münchener medizinische Wochenschrift. Munich.
Nebraska State Medical Journal. Lincoln.
New England Journal of Medicine. Boston.
New Orleans Medical and Surgical Journal.
New York State Journal of Medicine. New York.
New Zealand Medical Journal. Wellington.
North Carolina Medical Journal. Winston-Salem.
Northwest Medicine. Seattle.
Ohio State Medical Journal. Columbus.

*Cannot be lent.

Ophthalmologia Ibero Americana. Buenos Aires.
Pennsylvania Medical Journal. Harrisburg.
Physiological Reviews. Baltimore.
Prensa Médica Argentina. Buenos Aires.
Proceedings of Royal Society of Medicine. London.
Psychosomatic Medicine. Baltimore.
Public Health Reports. Washington, D. C.
Puerto Rico Journal of Public Health & Tropical Medicine. San Juan.
Quarterly Journal of Medicine. Oxford.
Radiology. Syracuse, N. Y.
Review of Gastroenterology. New York.
Revista de la Asociación Médica Argentina. Buenos Aires.
Revista Brasileira de Oto-Rino-Laringologia. São Paulo.
Revista Chilena de Pediatría. Santiago.
Revista clínica española. Madrid.
Revista de la Facultad de Medicina. Bogotá.
Revista médica de Chile. Santiago.
Revista Médica de Rosario. Rosario.
Rhode Island Medical Journal. Providence.
Rocky Mountain Medical Journal. Denver.
Schweizerische medizinische Wochenschrift. Basel.
Semana médica. Buenos Aires.
South African Medical Journal. Cape Town.
Southern Medical Journal. Birmingham, Ala.
Southwestern Medicine. Phoenix, Ariz.
Surgery. St. Louis.
Surgery, Gynecology and Obstetrics. Chicago.
Texas State Journal of Medicine. Fort Worth.
United States Naval Medical Bulletin. Washington, D. C.
Virginia Medical Monthly. Richmond.
War Medicine. A. M. A., Chicago.
Western Journal of Surgery, Obstetrics and Gynecology. Portland, Ore.
West Virginia Medical Journal. Charleston.
Wiener klinische Wochenschrift. Vienna.
Wisconsin Medical Journal. Madison.
Yale Journal of Biology and Medicine. New Haven.
Zentralblatt für Bakteriologie. Jena.
Zentralblatt für Chirurgie. Liepzig.

SUBJECT INDEX

This is an index to all the reading matter in The Journal. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "ab," abstracts; the star (*) indicates an original article in The Journal.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Am.—American *Nat.—National*
A.—Association *Pharm.—Pharmaceutical*
Coll.—College *Phys.—Physicians*
Conf.—Conference *Rev.—Revision*
Cong.—Congress *Ry.—Railways*
Conv.—Convention *Soc.—Society*
Dist.—District *Surg.—Surgery*
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